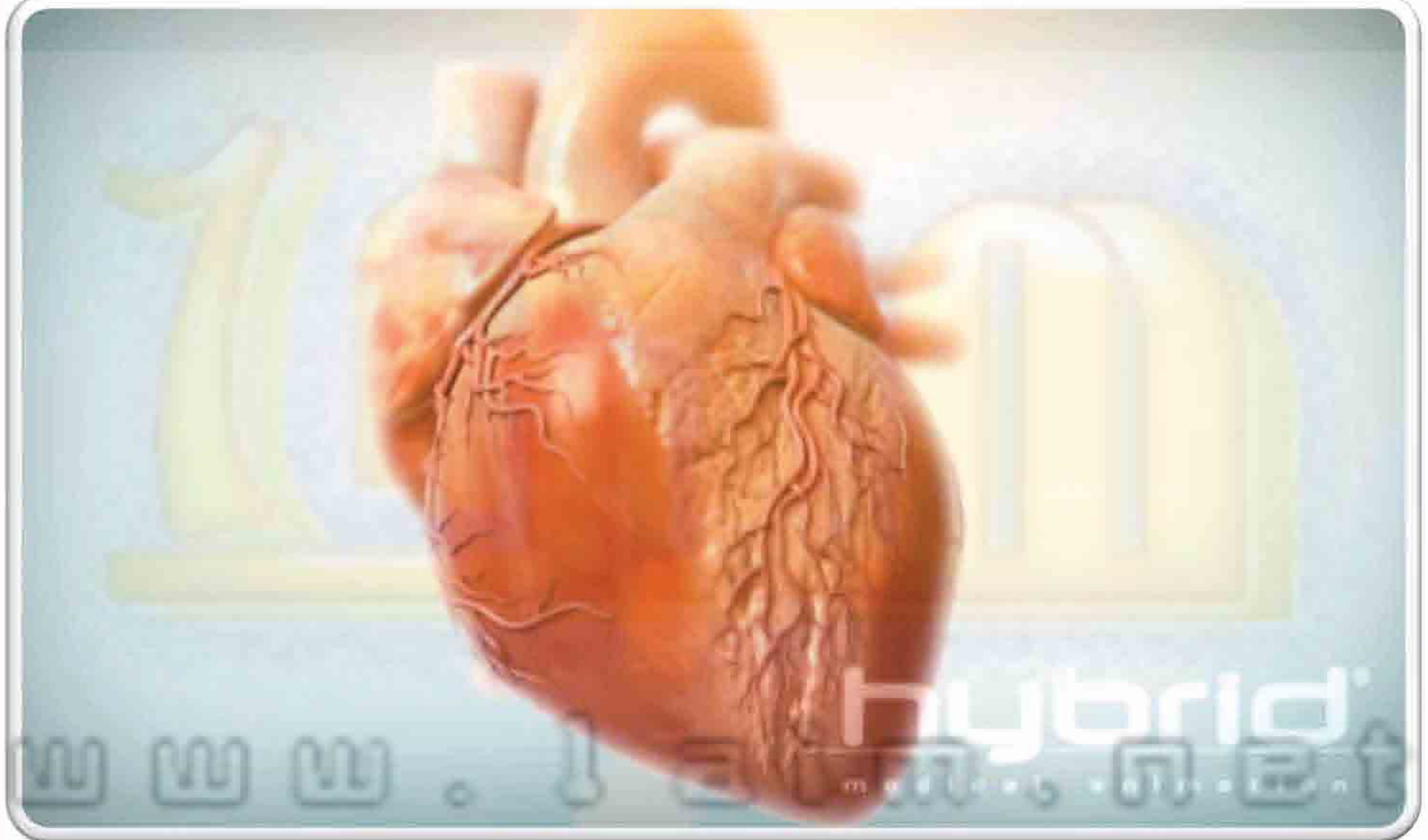


cardiology



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Index:

- **HEART FAILURE.** (SEE THE book)
- **HYPERTENSION.**
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- **VALVULAR HD.** (STENOSIS / INCOMPETENCE)
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- **REST of CARDIOLOGY:**
 - 1) **PERICARDITIS.**
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 - 5) **LA MYXOMA & MV PROLAPSE.**
 - 6) **PULMONARY HTN.**

VISIT...

LANZAROTE
Caliente.COM

HYPERTENSION

"PERSISTENT $\uparrow\uparrow$ BP > NORMAL ON 3 diff. OCCASIONS UNDER MENTAL & physical REST"

ISOLATED SYSTOLIC HTN (> 140 / < 90)

CAUSES

- A.I. -PDA
- Complete HB.
- Coarctation of Aorta.
- Atherosclerosis

Complications: if high pulse pr. → Cerebro Vascular Stroke.

TREATMENT

- 1) of the cause.
- 2) if $\uparrow\uparrow\uparrow$ SBP → Anti-hypertensive.

DIASTOLIC HTN (> 90)

	1 ^{RY} ESSENTIAL	2 ^{RY} HTN
• AGE	35 - 55	< 35 till 55 yrs.
• CAUSE	Not apparent	+ve esp. Renal /Endocrinal
• FH	+ve	- ve
• COURSE	Slowly prog. → benign	Rapidly prog. → malig. esp. in renal

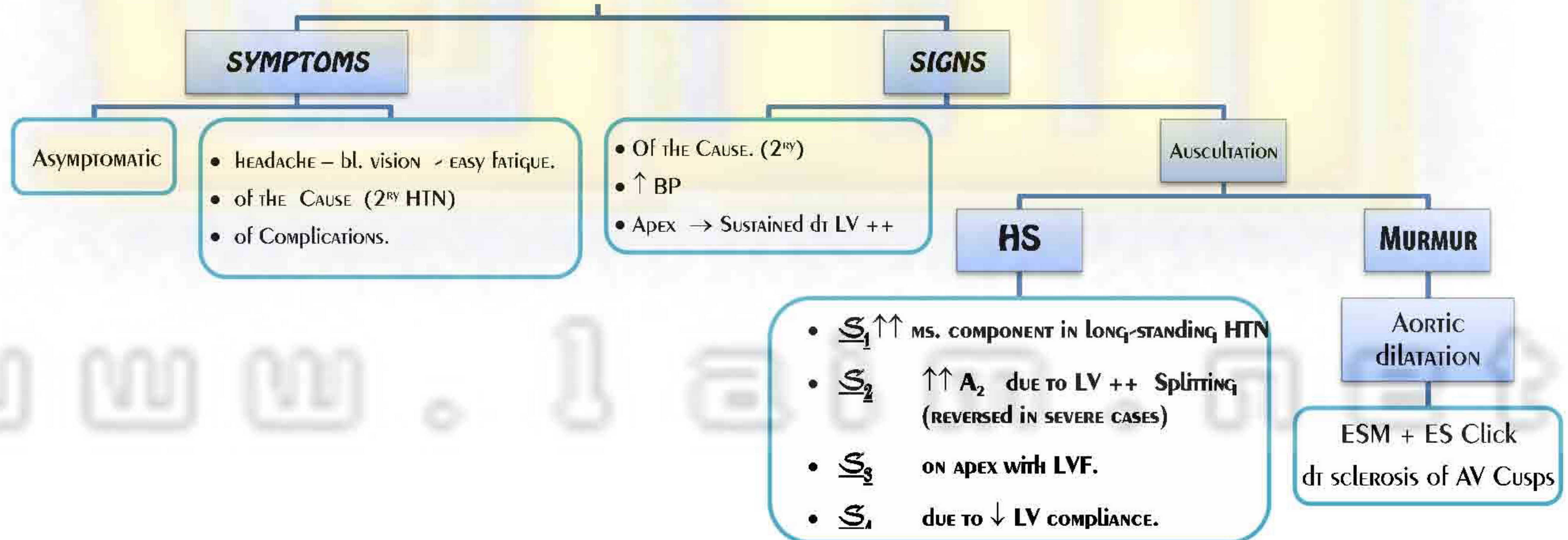
CAUSES of 2^{RY} HTN

1) RENAL	RAS / GN / ARF & CRF.
2) ENDOCRINAL	• ACROMEGALY - Thyrotoxicosis → systolic HTN • Cushing's → Na + H₂O retention + Sensitize T. to CA • Conn's disease → $\uparrow$ Aldosterone. • PHEOCHROMOCYTOMA → $\uparrow$CA.
3) NEUROLOGICAL	$\uparrow$ ICT → reflex $\uparrow\uparrow$ in BL. pressure. (Cushing Reflex)
4) CVS	COARCTATION OF AORTA.
5) PREGNANCY	PREECLAMPSIA.
6) Blood	polycythemia → hyperviscosity → $\uparrow$ BP.
7) DRUGS	CORTISONE + OCP + NSAID → Na & H ₂ O retention Ephedrine, Erythropoietin and Cyclosporine.

RECENT STAGING OF HTN

CATEGORY	Systolic	Diastolic
• NORMAL:	< 130	<85
• High NORMAL	130-139	85 -89
hypertension		
• STAGE I (mild)	140-159 1	90-99
• STAGE II (MODERATE)	160-179	100-109
• STAGE III (SEVERE)	> 180	> 110

Cl. /P of HTN



MALIGNANT HTN

"RAPIDLY PROG. HTN WITH EARLY COMPLICATIONS DUE TO FIBROID NECROSIS OF VASCULAR WALL"

(Cerebral hge - RF - HF)

CL/P

• **DBP > 130.**

- **Pallor** → *vasospasm* + *microangiopathic H.A*
- **Fundus** → *macular star* + **papilloedema**

COMPLICATIONS = ORGAN FAILURE

- 1) **HEART** → HF - ISHD - Diastolic dysfunction - Dissecting Aortic Aneurysm.
- 2) **NEURO** → Stroke (cerebral hge) - Lacunar infarction
- 3) **KIDNEY** → CRF in benign essential HTN - ARF in malignant HTN.
- 4) **EYE** → Retinopathy (silver wiring / Ar-V nipping / Hge - exudates / papilloedema)
- 5) **DRUGS S/E.**

INVESTIGATIONS

- 1) **ECG & X-RAY** → *LV⁺⁺ (long standing HTN)*
- 2) **FUNDUS EXAM.** → *acc. To the stage.*
- 3) **CAUSE:**
 - *↑ Cortisol - ↑ Thyroxin.*
 - *VMA, - plasma rennin*
 - **Na - K (Hypokalemic hypertension)**
- 4) **KFTs + RENAL Angiography.**

TREATMENT

- 1) **REST** → *during exacerbation rest in bed*
- 2) **STABLE CASES** → *moderation of life + avoid stress.*
- 3) **DIET** → *↓ Na Fat CHO + ↑ K*
- 4) **↓ WT** → *true fall in BP in over-wt. pt.*
- 5) **DRUG THERAPY**

DRUG THERAPY OF HYPERTENSION

DD OF HYPOKALEMIC HTN:

- 1) Conn's $\rightarrow \uparrow$ Aldosterone $\rightarrow \uparrow$ BP & K excretion.
- 2) Cushing's $\rightarrow \uparrow$ Cortisone $\rightarrow \uparrow$ BP & K excretion.
- 3) RAS $\rightarrow \uparrow$ Renin $\rightarrow \uparrow$ ANG-II $\rightarrow \uparrow$ Aldosterone.
- 4) Diuretics in hypertension.

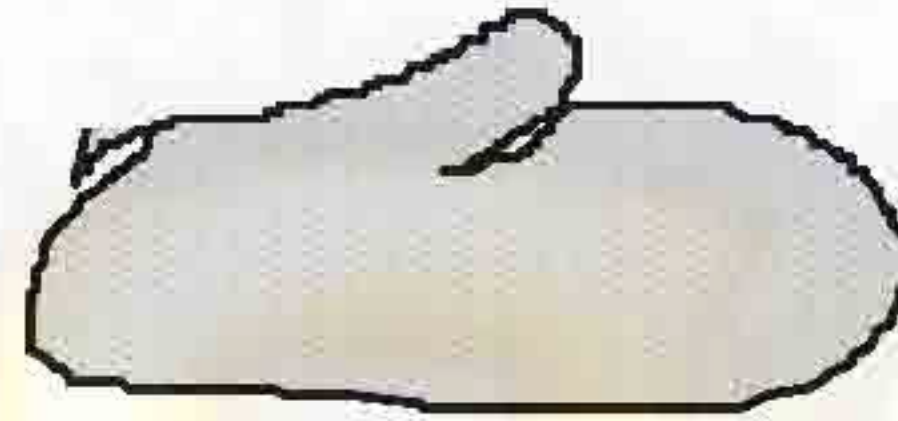
SPECIAL PROBLEMS IN HTN

HTN + ...	AVOID	GIVE
1) HF	• $\beta\beta$ IN (large doses so start by low dose & $\uparrow$ gradually). • CCB .(Verapamil)	<u>VD</u> + <u>Diuretics</u>. (ACE-I or ARBs) (NOT IN PVD)
2) COPD or BA	• $\beta\beta$(NON-SELECTIVE) $\rightarrow$ BS.	
3) DM	• $\beta\beta \rightarrow$ MASK S & S of hypo-glycemia. $\rightarrow$ hyper-lipidemia.	
4) PVD (Scleroderma / SLE)	• $\beta\beta \rightarrow$ block $\beta_2 \rightarrow$ UN-opposed $\alpha \rightarrow$ VC.	
(1-4) Avoid $\beta\beta$		
5) ISHD	<u>Avoid Tachycardia:</u> 1) hydralazine. 2) Nifedipine ALONE $\rightarrow$ Add $\beta\beta$.	1) $\beta\beta$ OR CCB. 2) ACE-I.
6) PREGNANCY (TIGHT CONTROL IS REQUIRED)	1) $\beta\beta$ (propranolol) $\rightarrow$ fetal bradycardia. 2) Diuretics $\rightarrow$ $\downarrow$ placental bl. Flow. 3) ACE-I $\rightarrow$ TERATOGENIC.	1) α -methyl dopa. 2) Hydralazine. 3) Atenolol, Labetolol 4) CCB.
7) RENAL D.		1) ACE-I (MONITOR K & s. Cr) 2) Lasix NOT Thiazides to $\uparrow$ GFR 3) Hydralazine. 4) $\beta\beta$ - CCB.
8) MALIG. HTN	<u>Avoid rapid $\downarrow$ BP</u> TO AVOID $\downarrow$ T. perfusion & ALTERED AUTO-REGULATORY MECH. $\rightarrow$ Cerebral damage.	<u>By infusion THEN ORAL if Stable:</u> 1) NATRATES. "of choice" 2) Na Nitro-prusside. 3) Hydralazine. 4) Labetolol.
9) HTN in Elderly	• $\beta\beta \rightarrow$ VC. • Thiazides $\rightarrow$ $\downarrow$ Na / K	1. ACE-I. 2. CCB. (Verapamil – Diltiazam)
10) DIASTOLIC DYSE.		$\beta\beta$ + CCB.
11) ISOLATED (S) HTN		Thiazides
12) UNI-LAT. RAS		ACE-I "of choice but # in Bilat RAS.

HYPERTENSIVE ENCEPHALOPATHY

"sudden marked $\uparrow$ BP $\rightarrow$ gush of blood to brain $\rightarrow$ diffuse Brain edema $\rightarrow$ coma without lat signs"

hypertensive encephalopathy



Diffuse edema by CT scan
(Both sides are affected)



No lateralizing signs



Rapid control of BP is required.

واحد ضغطه عالي
و اترمي في الارض فجأة

Stroke



Focal lesion
eg. Cerebral HGE /
lacunar infarction
(ONE side is affected)



+ve lateralizing signs



Compensatory $\uparrow$ BP
so rapid $\downarrow$ of BP is harmful

Treatment of H. Encephalopathy:

- 1) Anti hypert Infusion $\rightarrow$ hydralazine & frusemide + Nitrate + Na nitroprusside. (Infusion v. slowly & monitoring)
 - 2) Convulsions $\rightarrow$ Diazepam IV
 - 3) Brain edema $\rightarrow$ Frusemide Infusion. (# Mannitol to Avoid initial hyper-volemia)
- Refractory HTN M/C = non compliance + inadequate th. + un-known cause (RAS)

Surgically curable HTN ARE 2^{RY} HTN

- 1) RAS - Cushing \$
- 2) Acromegally - PHEOCHROMOCYTOMA.
- 3) COARCTATION of AORTA.

	ANGINA PECTORIS	MYOCARDIAL INFARCTION
<u>DEF</u>	<i>chest pain attacks due to coronary ischemia, (transient → no tissue damage)</i>	<i>complete cessation of coronary bl. flow due to occlusive thrombus (prolonged → tissue damage)</i>
<u>CAUSES</u>	1) <u>↓ CORONARY BL. FLOW</u> - Coronary spasm. (prinz-metal) - Atheroma. - Vasculitis. (♂ = PAN / ♀ = SLE) - Thrombosis or emboli. (in IEC) 2) <u>↓ O₂ TO MYOCARDIUM</u> → anemia – hypoxia - Hypo-tension. 3) <u>↑ O₂ DEMAND</u> → LV++ dt HTN / AS	(Ruptured Atheromatous plaque + Superimposed Thrombosis) 4 CASES of MI: 1) MI → DVT → Pulm. Embolism. 2) MI → Arrhythmia → HF → PE. 3) MI → HF → ARF → (ATN / pre-RF) 4) MI → Emboli from Aneurysm → hemiplegia.
<u>CL./P</u>	<u>ANGINAL PAIN + RF</u> - retro-sternal heaviness. - radiates to... jaw - Lt. shoulder – Arm - epigastrium (inf. wall) ↑ by exertion, ↓ by rest or nitrates. <u>HEART EXAM. is almost NORMAL</u> 1) HS ⇒ S₄ on apex. (↓ V. compliance → vigorous atrial cont) 2) MURMUR OF MI ⇒ due to ischemic papillary ms. 3) others ⇒ anemia - xanthelasma in hyper-lipidemia.	<u>MYOCARDIAL INFARCTION ⇒ chest pain differs from angina in....</u> - Severe – radiates more. - At rest – prolonged. - No response to nitrates. suspect MI if RF + sudden onset of: - hypotension (esp. if Nitrates are used) - Dyspnea dt HF. - Arrhythmia 1) ANXIETY. (sense of impending death) 2) ⊕ Sympath ⇒ cutaneous VC ⇒ pallor, cold sweating, ↑HR / tremors. 3) ⊕ Vagal ⇒ vomiting esp. (inf. wall infarction) 4) SINUS TACHYCARDIA & S₄.
<u>NB</u>	<u>ANGINAL PAIN</u> <u>Never to be</u> - Localized. - Stitching or throbbing. (cardiac neurosis) < 30 sec. > 30 min. except unstable angina. <u>PPT by</u> - Exertion, - Cold exposure. - Heavy meals. - Vivid dreams. (nocturnal angina)	Painless infarction D. neuropathy / Uremia. - during coma/ anesthesia. - Elderly. - Transplanted heart. (denervated) MYOCARDIAL INFARCTION + PE ?!! - EXTENSIVE MI → ACUTE LVF → ACUTE PE - Rupture papillary ms. → ACUTE MR → BACKWARD failure

INVESTIGATIONS

1) ECG	1) $\downarrow\downarrow$ S-T SEGMENT. 2) T- WAVE INVERSION. "If Resting ECG is normal $\Rightarrow$ STRESS TEST (Treadmill test) OR Dobutamine in pt. unable to do exertion"	ECG changes after 6 hrs. TRANS-MURAL $\uparrow\uparrow$ S-T SEGMENT - PATH. Q - INVERTED T SUB-ENDOCARDIAL $\downarrow\downarrow$ S -T SEG. - NON-Q INFARCTION - INVERTED T															
2) Echo or Dobutamine Echo	a) EJECTION FRACTION. b) VENTRICULAR DAMAGE.	a) EJECTION FRACTION. (PROGNOSTIC) b) HEART LESION.															
3) CARDIAC SCAN	REFLECTS CORONARY PERFUSION. (THALLIUM + EXERCISE $\rightarrow$ $\uparrow$ACCURACY)	<u>XRAY</u> PULM EDEMA															
4) TLC / ESR /CRP / CPK	NORMAL / NO TISSUE DAMAGE.	$\uparrow\uparrow$ DT TISSUE DAMAGE.															
5) CORONARY ANGIOGRAM (Diagnostic / Therapeutic)	Indications of Angiography: 1) ANGINA REFRACTORY TO MEDICAL TTT. 2) +VE STRESS TEST. 3) UNSTABLE ANGINA. 4) UNEXPLAINED SIGNIFICANT CHEST PAIN. 5) POST INFARCTION ANGINA.	<table><tr><td></td><td>C K-MB fraction</td><td>AST (SGOT)</td><td>CARDIAC Troponins (v. specific)</td><td>Mb (RECENT)</td></tr><tr><td>ONSET</td><td>4-6 HRS</td><td>12 HRS.</td><td>4-6 HRS.</td><td>2 HRS.</td></tr><tr><td>DURATION</td><td>2 DAYS.</td><td>3 DAYS</td><td>7-14 DAYS</td><td>24 HRS.?! </td></tr></table>		C K-MB fraction	AST (SGOT)	CARDIAC Troponins (v. specific)	Mb (RECENT)	ONSET	4-6 HRS	12 HRS.	4-6 HRS.	2 HRS.	DURATION	2 DAYS.	3 DAYS	7-14 DAYS	24 HRS.?!
	C K-MB fraction	AST (SGOT)	CARDIAC Troponins (v. specific)	Mb (RECENT)													
ONSET	4-6 HRS	12 HRS.	4-6 HRS.	2 HRS.													
DURATION	2 DAYS.	3 DAYS	7-14 DAYS	24 HRS.?!													
6) <u>Lipid profile</u> s. HOMOCYSTEINE. BS.																	

RF FOR ISHD = FOR CORONARY ATHEROSCLEROSIS

- 1) AGE > 40 . (if young age $\rightarrow$ Obesity Smoking Stress)
- 2) SEX $\text{♂} > \text{♀}$
- 3) +VE FH.
- 4) STRESS.

- 5) **Diet:** polyunsaturated fatty acids.
 $\downarrow$ Anti-oxidants.
 $\downarrow$ folate and Vit B₁₂ $\rightarrow$ $\uparrow$ homocysteine.
- 6) DM $\rightarrow$ hyper-insulinism $\rightarrow$ Atherogenic $\rightarrow$ hyper-tension.
- 7) hyper-lipidemia $\rightarrow$ $\uparrow$ LDL.
- 8) **Recent ass.** $\rightarrow$ $\uparrow$ s. homocysteine $\uparrow$ fibrinogen. $\uparrow$ CRP (b. pylori) / Chlamydia pneumoniae.

CLINICAL TYPES OF ANGINA

	STABLE	UNSTABLE	PRINZMETAL
etiology	stable atheroma in coronaries.	complicated athermanous plaque.	coronary spasm in young age.
RF	✓	✓	✗
ccc. of pain	- Mild. - short duration. ↑e exertion ↓e rest, nitrates.	- Severe & at rest. - prolonged. - Frequent ↑e exertion ... doesn't ↓e rest & nitrates.	Not related to exertion.
ECG	↓↓ S-T segment <u>If Resting ECG is normal</u> ⇒ stress test (treadmill test).	↓↓ S-T segment	DIAGNOSIS IN CCU PROVOCATIVE TEST "IV ERGONOVINE OR A.Ch" NORMAL PERSON NO EFFECT VASO-SPASTIC ANGINA CHEST PAIN + ↑↑ S-T "AS MI BUT NO PATH.Q"
Angio-graphy	stable atheromatous plaque CONTRAST NEPHROPATHY dt dye esp. in DM	atheromatous plaque ± coronary spasm	

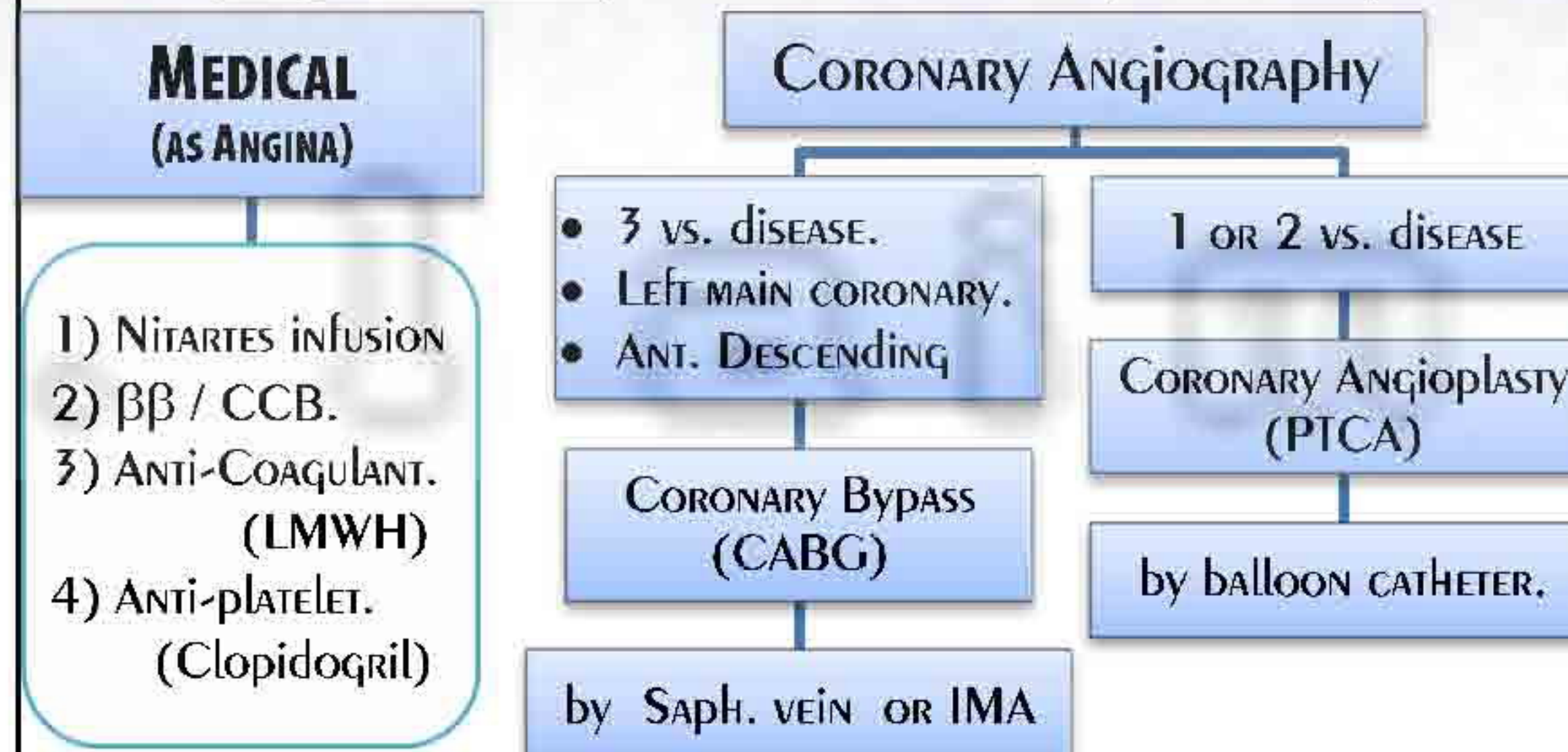
TREATMENT

➤ MEDICAL TTT. (IN LOW RISK)

- 1) $\beta\beta$ + CCB. (to Avoid ↑ HR)
- 2) NITRATES. (only if chest pain)
- 3) Anti-platelets.

➤ SURGERY: (high risk = CORONARY ANGIOGRAPHY)

hospitalization TO EXCLUDE INFARCTION (BY ENZYMES).



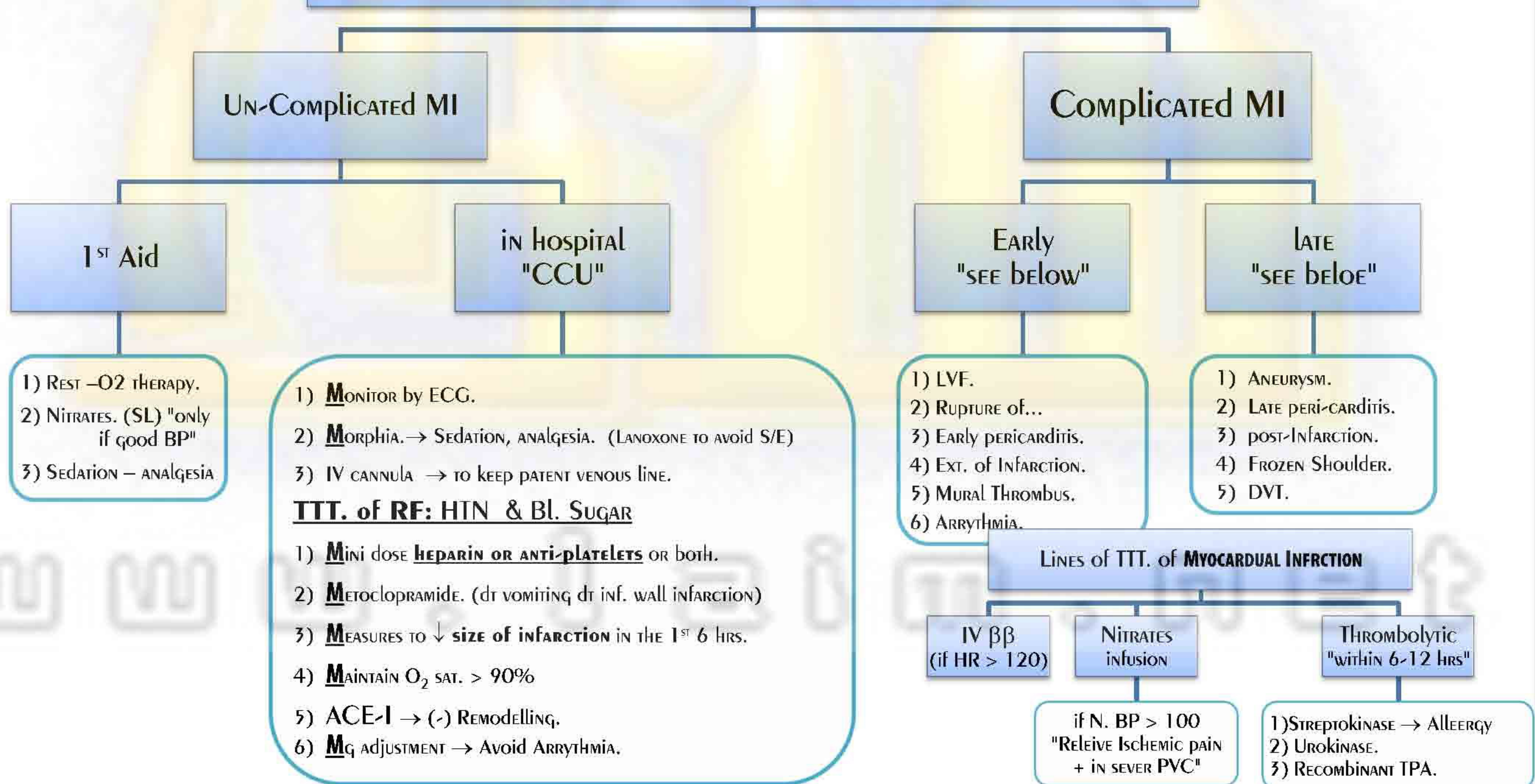
1) CCB OR NITRATES.

- 2) $\beta\beta$ ARE # to avoid coronary spasm dt un-opposed α_1 Rs.

Important Terms:

- **Decubitus Angina** → occurs on lying down...in LVE.
- **Nocturnal Angina** → vivid dreams → wake up the pt. from sleep.
- **Cardiac \$ X** → Angina + (+ve) exercise test + Normal angiography. (due to spasm in coronary μ -circulation)
- **Acute Coronary \$** → Unstable Angina or Myocardial infarction.

TREATMENT of MYOCARDIAL INFARCTION



TREATMENT OF COMPLICATED MI

EARLY COMPLICATIONS			LATE COMPLICATIONS		
LESION	CAUSE	TTT.	LESION	CAUSE	TTT.
1) LVF = HF	EXTENSIVE INFARCTION	4 Ds: 1) Dopamine / Dob. 2) Diuretics. 3) Digitalis. 4) Dilators.	ANEURYSM + REMODELING (6 wks post-infarction)	HEALED INFARCTION → WEAK SCAR ⇒ ANEURYSM → THROMBOSIS ARRHYTHMIA RUPTURE. persistent ↑↑ S-T > 2wks.	1) Anti-coagulant. 2) Anti-arrhythmic. 3) Aneurysmectomy.
2) Rupture of:	- papillary ms ⇒ ACUTE MI ⇒ PE - IVS ⇒ ACUTE VSD	✓ + VR when stabilized. ✓ + SURGERY when stabilized	LATE PERICARDITIS (Dressler's S)	DAMAGED PERI & MYOCARDIAL CELLS escape to bl ⇒ ⊕ IR ⇒ Auto-Ab against pericardium.	STERIODS. (# heparin → haemopericardium)
3) Early PERICARDITIS	- Chest pain → NO response to Nitrates. - pericardial Rub.	NSAID. (# heparin → haemopericardium)	POST INFARCTION ANGINA Or 2^{RY} PREVENTION of MI		1) Avoid RF. 2) Nitrates. 3) BB. 4) ACE-I. 5) CORONARY Angiography for REvascularization.
4) EXTENSION of INFARCTION	↑↑ PAIN AFTER INITIAL STABILIZATION (↑ MB "NEW MARKER" WITHIN 2 HRS)		FROZEN SHOULDER		Physiotherapy.
5) MURAL THROMBUS	DT ROUGH SURFACE OF INFRACTED AREA ⇒ THROMBUS ⇒ EMBOLI	Anti-coagulant	DVT → Pulm. Embolism.		
6) ARRHYTHMIA	V. EXTRASYSTOLE. V. TACH → VF - AF-HB				

Drug Therapy in Angina

DURING THE ATTACK

- 1) REST + O₂ therapy.
- 2) NITRATES. (SL) "only if chest pain"
- 3) RE-ASSURANCE AFTER EXAM.

INBETWEEN THE ATTACK

- 1) Diet: ↓ CHO ↓ FAT ↓ Salt.
- 2) Smoking + Modify life style.
- 3) of RF → DM / HTN / hyper-lipidemia.
- 4) Drug Therapy. (see below)

DRUG THERAPY OF ANGINA

®	NITRATES	β-blockers	DHP		NON-DHP		
			Nifedipine Addal = pure VD		Deliazam Deliazam	Verapamil Isopin	
Mech.	VENO-DILATORS → ↓ VR (↓ Work of the heart & ↑ coronary VD?!) used During the Attack to relief the Chest pain	1) (-VE) ino-tropic → ↓↓ O2 consumption.		VD	+++	++	+
		2) (-VE) chrono-tropic → ↑↑ CORONARY filling.		(-VE) Ino & Chrono.	x	++	+++ (Anti-arrhythmic)
USES	1) MYOCARDIAL INFARCTION. (if chest pain) 2) Oes. Spasm & Acalaxia. 3) PVC. 4) Biliary colic. 5) h. ENCEPHALOPATHY.	CVS USES (NOT Indral)	Non CVS USES (propranolol = Indral)	1) H. ENCEPHALOPATHY. 2) PVD. NB: 1) Nimodipine. "in sub-arachnoid hge dt reflex Cerebral VC." 2) Cinnarzin in TIA.		1) SV Arrhythmia. 2) HOCM. 3) Angina (EVEN VASO-SPASTIC)	
		- HTN - Angina - Arrhythmia - Cyanotic spills - MV prolapse. - HF (start low d. then ↑ gradually)	30-60 mg 60-120 mg Glaucoma. Thyrotoxicosis.. Fine Tremors. (↓T4 → T3) Parkinsonism. PH. (sphincteric VC) Migraine. (cross BBB)				
S/E	- Transient Headache. - Hypotension esp. e other VD.(so take in bed) - Tolerance on cb. use.	Bradycardia upto HB. • BS (if non-s)		1) Reflex ↑HR ... Acute ISHD. (so Add ββ)		1) HF except Amlodipen. "slow & long acting" → no marked ↑ HR... protect the brt"	
		HF. • Sudden stoppage → angina		2) Hypo-tension.		2) HB.	
		Depression. • Fatigue.		3) Headache. "transient"		3) Constipation Esp. "Verapamil"	
		Night mares. "indral" • Impotence.		4) LL edema → Diuretics.			
ROUTES of NITRATES:							
1) SL / Spray → Glyceryl Tri-NATRATE ...relieve attack with in 5 mins. ± Repeated.							
2) Oral → DiNATRA, "Effox" 20 mg TDS. (Iso-sorbide MONO-NITRATE)							
3) Inhalation → Amyl NITRATE.							
4) Ointment → AT NIGHT.							
5) IV → IN UNSTABLE ANGINA & MI.							
6) TD patches → LONG ACTING.							
# E Sildenafil (viagra) in pt. taking nitrates.							

DRUGS		USE	SIDE EFFECTS
-------	--	-----	--------------

1) Diuretics

a) Thiazide (25-50 mg)	Moduretic		1-hypokalemia
b) Indapamide (VD + Thiazide)	(Thiazide + Amiloride) Aldactazide	1-Hypertension + HF 2-Hypertension + DM	Add (Spironolactone or Amiloride)
c) Furesamide	Lasix Lasilactone	لا يعطى الا ف ظروف معينة: • H encephalopathy • H+ Renal D. ($\downarrow$ GFR) • $\downarrow$ GFR < 25 ml. / min	1-hypokalemia .. 2-hypovolemia Avoid use for long time
d) Spironolactone	Aldactone	1-Conn's S 2-with other diuretics 3-Hypertension + HF	1-hyperkalemia Monitor K level. 2-gynaecomastia Use Amiloride or Triametrine

NB: AVOID all diuretics in pregnancy as they $\downarrow$ placental blood flow.

2) β Blockers

1- Propranolol	Indral. "v. short acting"	1- H + IHD 2- H + Diastolic dysf.	1) BS $\Rightarrow$ Avoid in BA 2) VC of peripheral vs $\Rightarrow$ Avoid in PVD 3) fetal bradycardia $\Rightarrow$ Avoid in pregnancy 4) mask hypoglycemia $\Rightarrow$ Avoid in DM 5) (-ve) ino & chrono Use low dose in HF
2- Carvidolol (VD $\rightarrow$ TIT. of PVD)	Dilatrend		
3- Atenolol	Tenormin		
4- Bisoprolol	Concor		

4 & 5

NB: Carvidolol is a VD so used in PVD

3) α Blockers

a) Prazosin	Minipress	1- PVD	1-1 st dose hypotension $\Rightarrow$ Start low dose & on going to bed. 2-Tachyphylaxis.
b) Doxazosin	Cardura	H + Senile prostate.	
c) Labetolol		1) Pheocromo-cytoma. 2) H + pregnancy	

DRUGS

USE

SIDE EFFECTS

4) CENTRALLY ACTING DRUGS

1) α Methyl Dopa	Aldomet	H+ Pregnancy Refractory HTN.	1) depression <u>Add</u> antidepressants 2) extra-pyramidal manifest. 3) Auto-immune hepatitis & AIHA
2) Clonidine	Catapress	1-H 2- post menopausal flushes	1) Na & water retention .. <u>Add</u> diuretics 2) rebound HTN... <u>Gradual</u> withdrawal
3) Reserpine	Brinerdine	HAS NO ROLE IN RECENT MEDICINE	(1 & 2) as methyl dopa + nasal congestion

5) VASO-dILATORS

A. ARTERIAL VD

1) Hydralazine	Apresoline	1) H encephalopathy 2) H + Pregnancy.	Reflex $\uparrow$ HR $\rightarrow$ $\downarrow\downarrow$ coronary filling $\rightarrow$ <u>Avoid</u> in IHD / SLE like / flushing.
2) CCBs • Cerebral. • Coronary • periph. VD -ve Ino & Chronotropic	SEE ISHD.	1) H + BA 2) H + DM 3) H + ISHD 4) H + Pregnancy 5) H + Diastolic dysf. 6) H + PVD 7) H in elderly	
3) Diazoxide		1) H encephalopathy. 2) Insulinoma.	(-) insulin release <u>Avoid</u> in D.M
4) Minoxidil		Topically for alopecia	Hyper-trichosis

b. VENO-dILATORS

Nitrates inf.	Tridil	SEE ANGINA + H. ENCEPHALOPATHY.
---------------	--------	---------------------------------

c. Mixed VD

1) Na Nitro-prusside	Niprid "v. potent"	1-H encephalopathy 2-Cardiogenic PE	1) Hypotension. (sever) 2) Cyanide toxicity in liver D. (pink color / dilated pupil) 3) Thio-cyanate toxicity in Renal D. (Tinnitus / skin rash)
2) ACE-I ($\downarrow$ ANG-II... $\rightarrow$ VD / $\downarrow$ Aldosterone)	Capotin Tritace Ezapril Zestril	1) HTN. 2) HF. ($\downarrow$ Remodeling) 3) D. Nephropathy $\downarrow$ IGP dt VD of eff. A. (Reno-protective) 4) Renal HTN.	1) chronic dry cough $\Rightarrow$ <u>Use</u> ARBS 2) hyperkalemia $\Rightarrow$ <u>Monitor</u> K / s. Cr. 3) Nephrotic \$. (Membranous GN) # in pregnancy $\Rightarrow$ teratogenic. # in Bi-lateral RAS.
3) ARBs	Cozar (Losartan) Tareq (Valsartan)	As above but <u>no cough</u> .	

TACHY-ARRHYTHMIA

<i>sinus Tachycardia</i>	PAT	PUT	ATRIAL FLUTTER	ATRIAL Fibrillation
SAN discharges impulses > 100 – 160 / m	paroxysmal attack of ectopic focus in atrium > 200 / m (<u>regular Tachycardia</u>)	paroxysmal attack of ectopic focus in Ventricle > 200 / m (<u>regular Tachycardia</u>) (no retrograde conduction)	ectopic focus in atrium > 200 / m (<u>regular</u>) ⇓ presentation according to the A-V block.	Multiple ectopic foci in atrium discharge 400-600 / m. (v. rapid Irregular) ⇓ presentation according to the A-V block.
		A-V Dissociation V. follows focus Atria follows SAN	SHORT-lived ARRHYTHMIA RETURN TO SAN PROGRESS TO AF	M/C SUSTAINED ARRHYTHMIA ↑ HR ↓ HR "slow AF in Digitalis Toxicity"
➤ CAUSES				
1) FUNCTIONAL - STRESS, EXCESS COFFEE, SMOKING. - PREGNANCY, FEVER. - ANEMIA, THYRO-TOXICOSIS. 2) HF (V. COMMON) → COMPENS. ↑HR. 3) DRUGS - ATROPINE - B₂AGONIST. - THYROXINE - VD. (NIFEDIPINE) - SYMPATHOMIMETIC. (TTT. OF COPD / BA) - EI DUE TO DIURETICS / LAXATIVES.	1) FUNCTIONAL: STRESS, EXCESS COFFEE, SMOKING 2) DRUGS: SYMPATHOMIMETIC. (TTT. OF COPD / BA)	DISEASED HEART - ISCHEMIC H.D - CONG. H.D - RHEUMATIC H.D - MYOCARDIAL INFARCTION. - DIGITALIS TOXICITY. → V. EXTRA-SYTOLE → VT → VF. - ABUSE OF ANTI-CHOLINERGIC (TCA- ANTI-HISTAMINICS)	ORGANIC HD.	↑ LA pr. / ↑ LA dilat. - Rh. MS (↑LA pr.) - ASD (LA++) - ISHD (↓V. compliance → ↑LA pr.) - HTN (LV++ → LA++) - CONSTRUCTIVE PERICARDITIS. (Catching of LV → ↑LA pr) - IEC. - Thyrotoxicosis. (Thyrocardia) - Pulm emb → ACUTE pr. Load on RV. - Wolf Parkinson White \$. (Additional pathway) - LONE AF. (unknown cause)

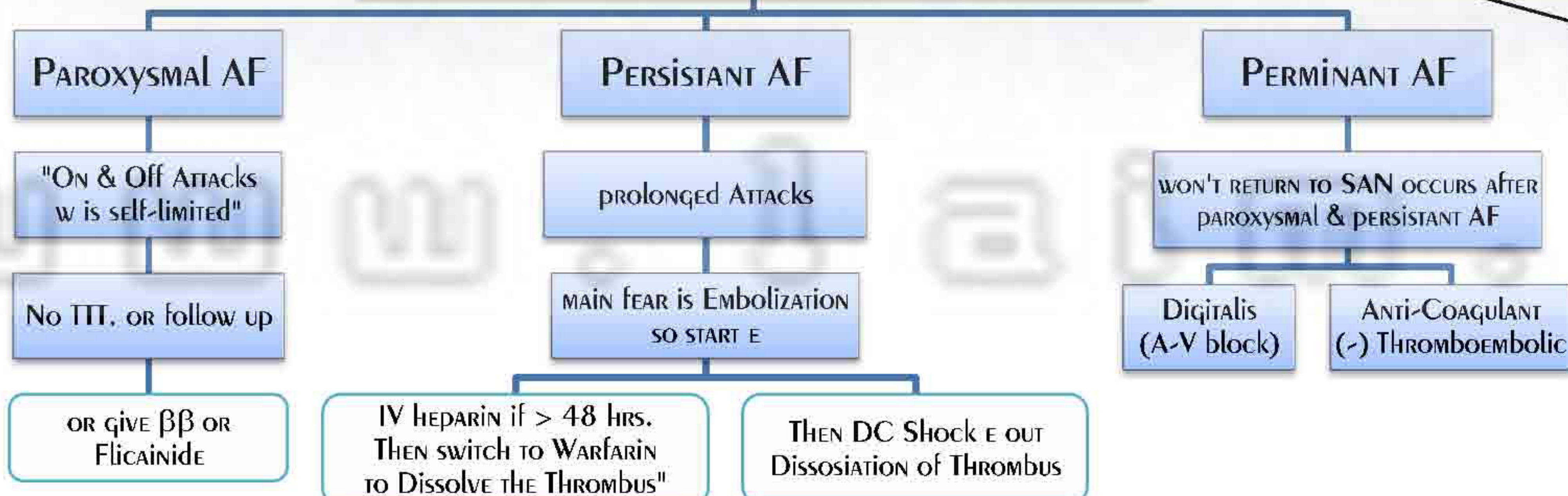
➤ Cl./P of Arrhythmias

	<i>S. Tachycardia</i>	PAT	PVT	ATRIAL FLUTTER	ATRIAL FIBRILLATION
1) <u>palpitation</u> • onset • offset • rhythm • duration • what ↑ or ↓	<u>أوصف نفسك و انت طالع السلام</u> GRADUAL GRADUAL REGULAR ↑↑ BY EXERTION	SUDDEN SUDDEN REGULAR VARIABLE RECURRENT & FREE IN BET. ATTACKS	SUDDEN SUDDEN REGULAR VARIABLE	As PAT SUDDEN SUDDEN REGULAR SHORT LIVED ARRHYTHMIA THEN TURN TO → SAN OR AF.	IRREGULAR OCCURS AT REST. SUSTAINED ARRUTHMIA. ↑↑ WITH EXERTION
2) <u>↓COP symptoms</u> (Dizziness / Syncope)	✗	✓	✓	✓ DT SEVERE TACHYCARDIA	✓
3) of the cause	ANEMIA / THYRO-TOXICOSIS	Palpitation then Chest pain ... Arrhythmia. Chest pain then Palpitation ... ISHD.	ISHD / MI.		
CARDIAC SIGNS					
1) <u>pulse</u> • HR • rhythm	100 – 160 REGULAR	UP TO 200 REGULAR	UP TO 200 REGULAR	TACHYCARDIA. (REGULAR) VENTRICULAR RATE = ½ ATRIAL (2:1 AV BLOCK)	• Irreg. irregularity (↑↑ e exertion) • PULSES DEFICIT > 10 / MIN.
2) BP.	NORMAL	↓↓ BP DT ↓ HEART FILLING	↓↓ BP DT ↓ COP	↓ SEVER TACHYCARDIA	VARIABLE (AVERAGE OF 3 TIMES)
3) CAROTID MASSAGE	✓	✓	✗	✓	✗ (DT MULTIPLE FOXI)
4) <u>RESP. SINUS</u>	✓	✗	✗	✗	✗
5) <u>NECK VEINS = CANON WAVE</u>	✗	✗	✓ ... OCCASIONAL (A-V DISSOCIATION)	✗ (Rapid, multiple A waves before each V wave)	ABSENT A WAVE.
HS	↑ S ₁ & S ₃ GALLOP ON APEX DT HF	↑ S ₁	occasional CANON SOUNDS.	↑ S ₁ + MURMUR.	S ₁ VARIABLE + MURMUR.
<u>INVEST.</u> 1) ECG. (HLOTER IN BET. ATTACKS) 2) Echo. 3) of the CAUSE.	SINUS R. > 100 / M. 1) Thyro → T ₃ , T ₄ , TSH. 2) ANEMIA → Hb. 3) DIURETICS → M _G / K.	DEFORMED P WAVES: 1) Rapid > 200/M. 2) REGULAR. 3) <u>NARROW QRS. "NORMAL"</u>	1) Rapid. 2) REGULAR. 3) <u>BIZARRE SHAPED QRS.</u> ➤ ↓ s. K & M _G .	1) Saw TOOTH app. (FLUTTER WAVES)	1) <u>IRREGULAR</u> RHYTHM. 2) <u>ABSENT P</u> WAVE. 3) T ₃ , T ₄ , TSH.

TREATMENT OF ARRHYTHMIA

<i>S. Tachycardia</i>	PAT	PUT	ATRIAL FLUTTER
<u>Only if Symptomatic</u> 1) Avoid RF: • smoking. • Caffeine. • Chocolate. 2) $\beta\beta$ → CONCOR COR	DURING THE ATTACK CAROTID MASSAGE IV DRUGS 1) IV VERAPAMIL: "of CHOICE" (v. slowly + CA GLUCONATE) 2) IV $\beta\beta$ in Thyro.. 3) ADENOSIN → No -ve INTOTROPIC (so used in HIF & Shock) 4) IV Digitalis DC shock DOESN'T AFFECT CONTRACTILITY USED IN HF / Shock INBETWEEN THE ATTACK 1) HF → Digitalis. 2) STRESS/ Thyro- toxicosis → $\beta\beta$. 3) ISHD → VERAPAMIL	DURING THE ATTACK IV drugs 1) IV LIGNOCAINE.. 2) IV PHENYTOIN in Digitalis Toxicity. DC shock "if ↓BP / PE" INBETWEEN THE ATTACK 1) of the CAUSE. 2) AMIODARONE. 3) IMPLANTABLE DEFIBRILATOR.	1) DC shock. 2) $\beta\beta$. 3) CCB. "VERAPAMIL" 4) Digitalis.

TTT. of Atrial Fibrillation



Complications of AF:

- 1) STAGNATION of bL in LA
→ Thrombo-emboli to brain →
Cognitive dysfunction. → so do MRI.
- 2) ANGINA dt ↑ HR & ↓ COP.
- 3) AGGRAVATE HF & PVC.

	EXTRA-SYSTOLE	<i>sinus Bradycardia</i>
	extra beat ... dropped or strong beat	HR < 60 /m. (SAN is the pace maker)
CAUSES	1) FUNCTIONAL: - Smoking / Stress - Excess Coffee. ↓Mg. 2) RHEUMATIC HD. 3) DRUGS (↑ HR) → Sympatho.. / Digitalis toxicity. (bi-geminy)	1) Physiological → Sleep & Athletes. 2) Obst. JAUNDICE → Bile salts → ⊖ SAN / AVN. 3) hypothyroidism: - fe constipation. - HR = 62 /m - Skin abnormality. "Myxedema" 4) BRAIN TUMOR → ↑ ICT → ↑ SBP / ↓ HR. (OR Sub-ARACH. hge) (Cushing Reflex) 5) DRUGS → BB - CCB - -digitalis
C/P	1) Palpitations: (Occasional) - irregular at rest & ↓↓ with exertion. 2) OF THE CAUSE.	1) Asymptomatic. 2) Orthostatic hypotension in hot weather. 3) OF THE CAUSE.
SIGNS	Pulse → <u>regular irreg. or occasional irreg.</u> ✓ Pulsus bigeminy or Trigemny. ✓ Pulse deficit < 10 BP → NORMAL. CAROTID MASSAGE → ✕ NECK VEINS → ✕ <u>Local examination:</u> S ₁ variable intensity	Pulse → < 60 / m. (regular) BP → normal. NECK VEINS → ✕ Resp. sinus → ✓
INVEST.	1) ECG / Echo. 2) T₃ T₄ TSH. 3) K – Mg.	1) Echo & ECG → ↓ HR + SINUS RHYTHM. 2) T₃ T₄ TSH. 3) CORTISOL LEVEL.
TTT.	1) OF THE CAUSE 2) NO TTT. AS LONG AS NO ORGANIC HD. 3) IN IRRITABLE PERSON → ββ. 4) DANG. EXTRA-SYSTOLE → MUST BE TTT. by AMIODARONE. - frequent - multi-Focal - Ventricular → VT → VF. - Diseased beat.	(No safe drug to ↑↑BP or ↑↑HR) TTT. of Idiopathic hypotension: (dr ↓ sympathetic outflow) 1) plenty of fluids + ↑ Salts. 2) ACETONIN H. "Aldosterone Analogue" 3) Sympatho-mimetics "Midodrin®" (قرص عند اللزوم 3 / day upto)

IMPORTANCE OF NECK VEINS IN ARRHYTHMIA.

- 1- AF & A. flutter.
- 2- extrasystole.
- 3- V. tachycardia.
- 4- Complete HB.

AMIODARONE IS USED IN TTT. of:

- 1) PAT.
- 2) V. TACH. (IN-BET. ATTACKS.)
- 3) DANG. EXTRA-SYSTOLE.
- 4) Wolf –PARKINSON WHITE \$.

HEART BLOCK

CAUSES of HEART block

PATHOLOGICAL

- 1) ISHD.
- 2) RH. HD
- 3) Cong. HD.
- 4) CARDIOMYOPATHY.

DRUGS

- 1) $\beta\beta$.
- 2) CCB.
- 3) Digitalis.

- 1) SAN block $\rightarrow$ failure of SAN to $\oplus$ ATRIUM.
- 2) BBB
 - $\rightarrow$ Rt. BBB $\rightarrow$ wide splitting $S_2 \rightarrow$ ECG findings.
 - $\rightarrow$ Lt. BBB $\rightarrow$ REVERSED splitting $S_2 \rightarrow$ ECG findings.
- 3) A-V Block $\rightarrow$ 3 DEGREES (SEE BELOW)

	1 ST degree HB	2 ND degree HB	3 RD degree HB = Complete HB
	ECG finding = Fixed $\uparrow$ P-R interval	partial HB So SOME impulses fail to pass from A $\rightarrow$ V	A-V dissociation $\rightarrow$ Idio-ventricular rhythm.
CL./P	NOT DANGEROUS & OCCURS physiological during SLEEP & in ATHELETES. dt $\uparrow$ VAGAL TONE.	- Asymptomatic - Bradycardia. $\downarrow$ COP $\rightarrow$ <u>Adam's Stock Attacks in Mobitz II</u> $\rightarrow$ no impulses will pass from A to V $\rightarrow$ transient arrest $\rightarrow$ syncope. $\rightarrow \oplus$ Idio-ventricular rhythm $\rightarrow$ patient regains his consciousness. (RECURRENT SYNCOPE)	- Palpitation. (regular - slow) $\downarrow$ COP - Adam's stock attack. (Recurrent Syncope) Signs - Pulse < 60 (35 - 40 /m - Regular) $\downarrow\downarrow$ BP or Systolic HTN (acc. to the myocardium) - Neck veins: $\pm$ Cannon wave
INVEST. = ECG	Fixed $\uparrow$ P-R interval (> 0.2 second) مربع كبير (All impulses from SAN pass to ventricles)	Mobitz Type I Progressive prolongation of P-R interval followed by dropped QRS (Wenckebach's phenomenon) Mobitz Type II P waves $>$ QRS. $\downarrow$ ratio 2:1, 3:1	- Regular Bradycardia. - A-V dissociation = P $>>$ QRS.
TREATMENT	1) SEARCH FOR THE CAUSE. $\rightarrow$ SEE b4 2) Avoid Digitalis BB CCB	1) CAUSE. 2) Atropine $\rightarrow$ ENHANCE CONDUCTION 3) PACE MAKER.	1) OF THE CAUSE. 2) Atropine 3) PACE MAKER. "THE BEST"

Wolff Parkinson white \$

ABNORMAL CONNECTION bet. Atria & Ventricles by-passing the AVN

$\rightarrow$ short P-R interval

$\rightarrow$ V. Tach. $\pm$ AF may occur $\rightarrow$ collapse.

TTT.

- 1) Amiodarone $\rightarrow$ $\downarrow$ conduction in accessory pathway.
- 2) # Digitalis and Verapamil $\rightarrow$ $\uparrow$ conduction in accessory pathway.
- 3) Radio freq. ablation pathway.

Sick Sinus \$

SAN disease due to degeneration, ischemia.

It may lead to :-

- Sinus bradycardia.
- Sinus arrest. (Adam Stock's syncope)
- Paroxysmal tachycardia.
- Paroxysmal AF.
- $\rightarrow$ TTT: PACE-MAKER.

CAUSES of Systolic HTN:

- 1) AI.
- 2) Atherosclerosis.
- 3) Throtoxicosis.
- 4) **Complete HB.** (dt $\uparrow$ Time of V. filling + if the V. is Strong)

TREATMENT OF ARRHYTHMIAS

TTT. of Arrhythmia

PAROXYSMAL

Non-PAROXYSMAL

DURING THE
ATTACK

INBETWEEN THE
ATTACK

MAINT. TH. "ORAL"
FROM THE START.

IV drugs OR
DC shock

MAINTANANCE TH. by
ORAL drugs

CLASS I

Quinidine - procainamid
lignocaine - phenytoin.
flecainide
They ⊖
excitability & conduction.

CLASS II

BB

CLASS III

Amiodarone

CLASS IV

CCB. (verapamil)

	Mechanism	Uses	S/E
1) VERAPAMIL	CCB	PAT	C b4
2) LIGNOCAINE	Na ch. blocker	V. Tach. (DURING THE ATTACK)	convulsion- confusion
3) PHENYTION	Na ch. blocker	DIGITALIS INDUCED V. TACHYCARDIA.	
4) QUINIDINE	(-) Atrial Foci	AF.	Allergy - <u>Cinchonism</u> (N V Tinnitus) ↑ A-V conduction → so Add Digitalis before.
5) B.B.	- Sotalol (β-core) - Bisoprolol. - Atenolol.	STRESS Thyro.. Arrhythmia: - Sinus Tachycardia. - Extrasystole. - PAT.	
6) AMIODARONE	CCB. K channels. Na channels.	ANTI-ARRHYTHMIC (BS) - PAT V. Tachycardia. (in bet. Attack) - DANG. EXTRASYSTOLES. - WOLF-PARKINSON WHITE S	- Corneal deposits → Slit lamp / 6ms. - Thyroid dysfunction → T₃ T₄ TSH. (mainly hypo-thyroidism) - IPD.
7) ADENOSINE	Block SAN & AVN. (Acts as Carotid massage + no -ve inotropic → good in HF)	PAT. HF.	# in HB (flushing, dyspnea, chest pain)

Anticoagulants

Indications = HEART & BRAIN	Contraindications
1) Recent MI – unstable angina – AF. 2) Cerebro vascular insufficiency. 3) Thrombo-philia. 4) DVT, pulmonary. embolism	1) Liver cirrhosis, haemorrhagic diseases. 2) GIT Ulcers. 3) IEC → cerebral hge. (although it is a Thrombo-embolic D. but Anti-Coagulants are for fear of rupture of Mycotic Aneurysm → ICH) 4) MI + pericarditis → haemopericardium. 5) Severe uncontrolled HTN.

	HEPARIN	ORAL = WARFARIN
Action	⊕ AT-III	↓ Synthesis of Vit. K dep. FACTORS. (1972)
Controlled by	PIT = 1.5 - 2 control	PT = 1.5 control INR = (2.5 - 3.5)
Antidote	PROTAMINE sulphate - fresh blood.	vit. K. - fresh blood.
Dose	◇ 1000 U / hr IV (Infusion) ◇ 5000 - 7500 U / 6 hrs (IV) ◇ 10,000 U sc / 8 hrs. (SC)	• PHENANDIONE (Dindevan) • WARFARIN.
PRECAUTIONS	1) <u>AT-III deficiency</u> → ↓ heparin response. 2) <u>LMWH (Clexan)</u> → ↓ Incidence of hge. → Given without monitoring. • Th. Dose → 60-80 U/12 hr. • Proph. Dose → 20 U / 12hr.	• ↓ Factor 7 after 6 hrs. • ↓ Factor 9 after 24 hrs. • ↓ Factor 10 and pro-thrombin after 48 hrs from the start of anticoagulant

HEPARIN is STARTED CONCURRENTLY & WARFARIN FOR 3-5 days till WARFARIN REACHES THE THERAPEUTIC LEVEL.

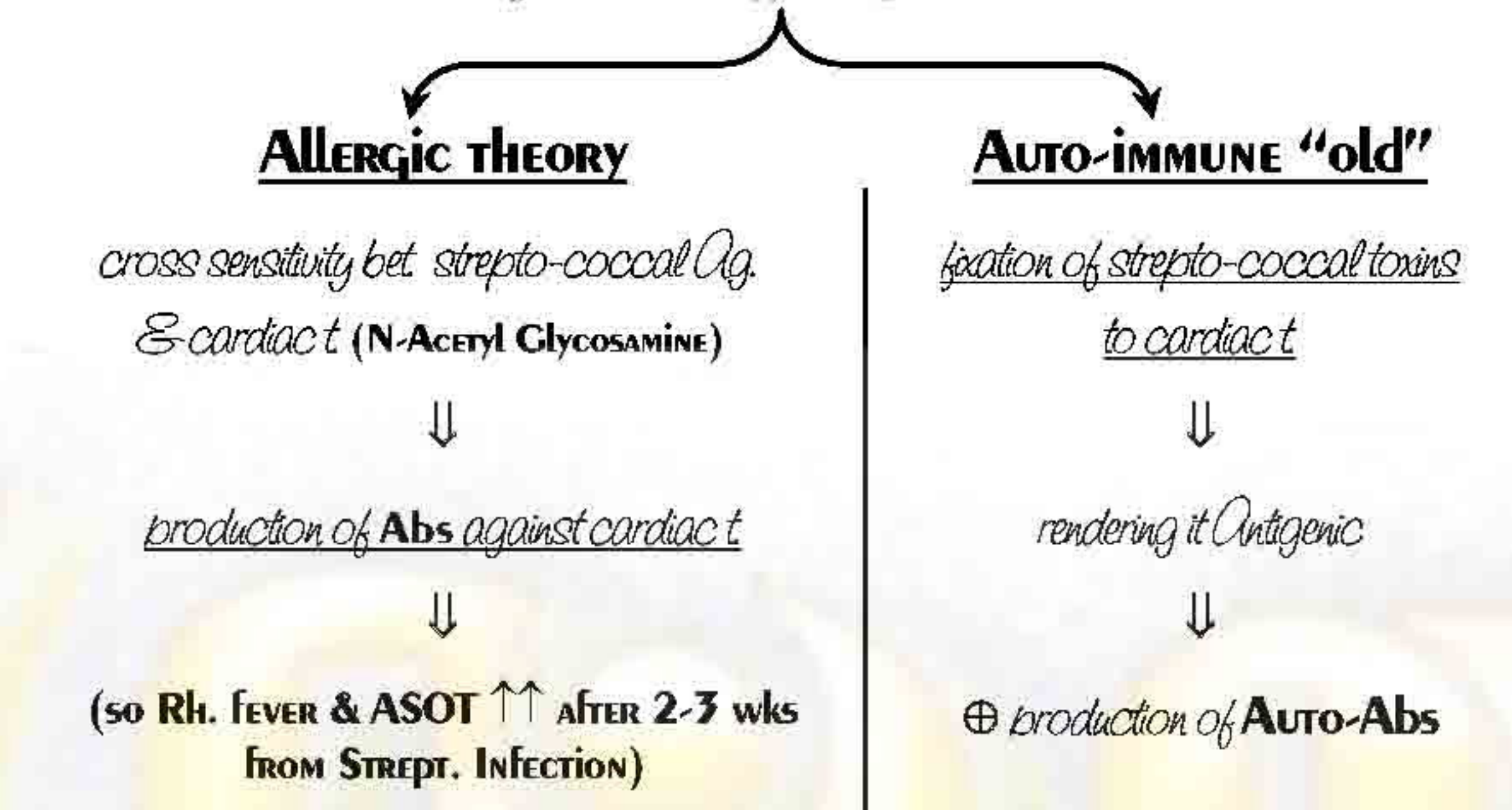
CARDIAC ARREST

	V. Fibrillation	V. Asystole	ELECTROMECHANICAL Diss.
	(M/C) cause & the most easily treatable rapid ineffective mov. of the ventricles.	occurs when there is no electrical activity of the ventricles	no effective COP inspite of the presence of normal electrical activity.
CAUSES	1) ISHD 2) ELECTROCUTION 3) hypokalemia. 4) STRUCTURAL HEART D.	1) ADAM'S STOCK. (2 nd OR 3 rd HB) 2) EXTENSIVE MI.	1) TENSION PNEUMOTHORAX. 2) TAMPONADE. 3) MASSIVE PULMONARY EMBOLISM FROM DVT. 4) CARDIAC RUPTURE.
DIAGNOSIS ECG	Complexes wide QRS. bizarre irreg.	ISOELECTRIC line.	QRS without palpable pulse
TREATMENT	<u>DC Shock upto 3 TIMES</u> ↓ <u>ADRENALINE</u> (1mg IV OR INTRA-CARDIAC) ↓ <u>DC Shock</u> ↓ <u>INTERNAL Defibrillator</u>	<u>DC Shock+ Atropine</u> ↓ <u>ADRENALINE</u> (1mg IV OR INTRA-CARDIAC) ↓ <u>PACE MAKER</u>	1) CPR 2) AdRENALINE 1 mg IV 3) <u>TREATMENT OF THE CAUSE:</u> • <u>TENSION pn.</u> → Needle in 2nd IC space MCL. • <u>pulm. Embolism</u> → Thrombolytic th. • <u>Tamponade</u> → URGENT PERICARDIOCENTESIS.

rheumatic fever

"inflammatory disease following infection e Group A strepto-cocci

It is a multi-systemic d. affecting heart skin joints & CNS.



Epidemiology:

- 1) AGE: 5-15 ys. (SCHOOL AGE)
- 2) SEX: EQUAL (CHOREA COMMON IN FEMALES)
- 3) ↓↓ **SHINE + RECURRENT STREPTO-COCCAL INFECTION.**
- 4) FH

Diagnosis ⇒

MODIFIED JONE'S CRITERIA

MAJOR "CASE"	MINOR
1) C arditis. 2) A rthritis. 3) C horea. 4) S c node. 5) E rythema marginatum	1) F ever 2) A rthralgia. 3) H istory of R heumatic fd. 4) ↑ T LC / E SR / C RP. 5) ↑ P-R interval. (1 st or 2 nd HB)
EVIDENCE OF STREPT INFECTION	

- 1) Abs.
- 2) C&S.
- 3) Recent history of Scarlet fever.

RHEUMATIC FEVER CAN BE DIAGNOSED if THERE ARE

- 2 MAJOR + EVIDENCE OF STREPT. INFECTION.
- 1 MAJOR + 2 MINOR + EVIDENCE OF STREPT. INFECTION.

1) If ARTHRITIS is PRESENT → ARTHRALGIA is NOT A MINOR?

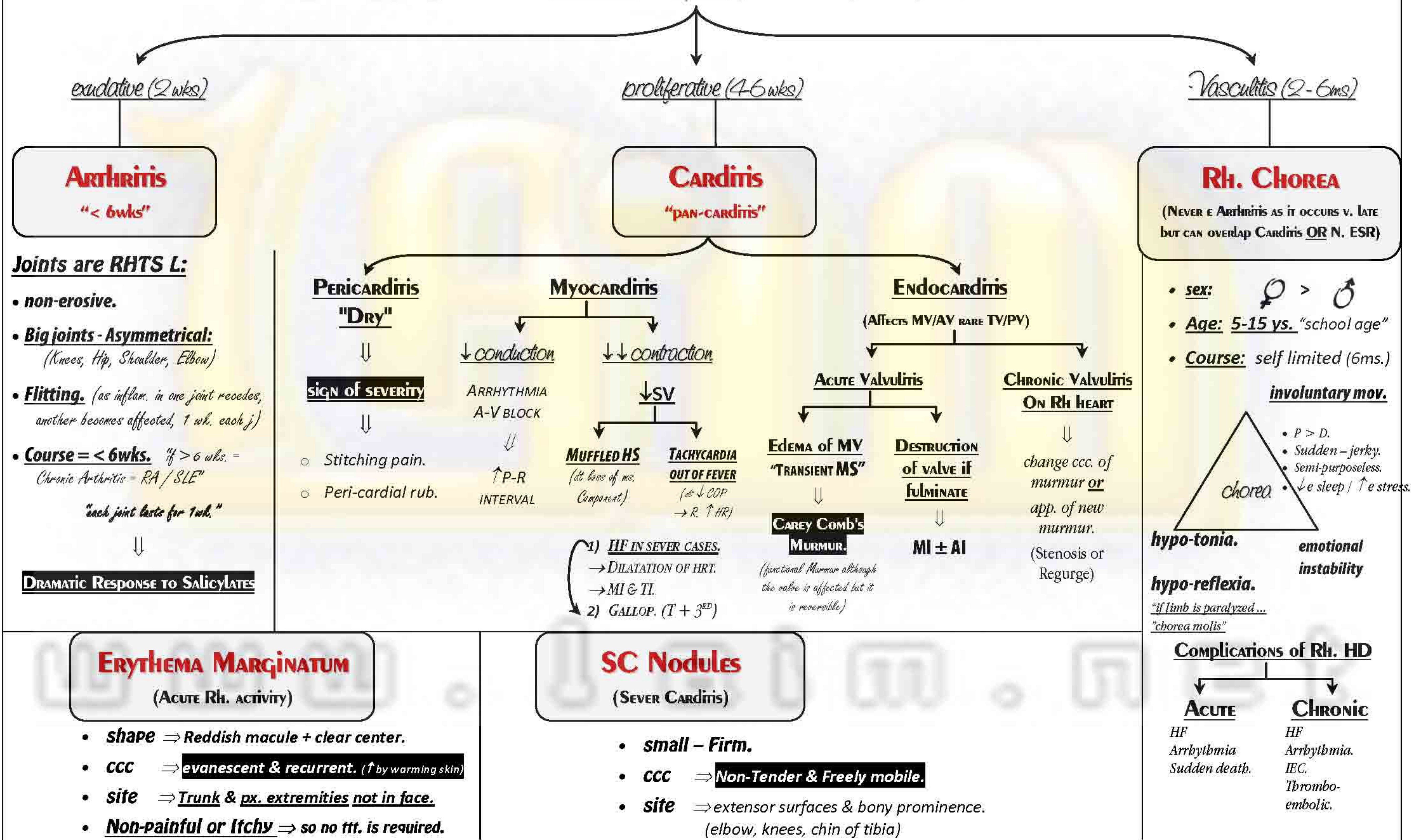
2) If CARDITIS is PRESENT → ↑ P-R INTERVAL is NOT A MINOR?

3) Rh. CHOREA (OCCURS AFTER 6MS.) → MAY NOT BE ACCOMP. BY OTHER MANIF. OF STREPT. INFECTION.

So DIAGNOSIS MAY BE BASED ON ONE MAJOR CRITERIA ONLY = CHOREA after exclusion of other causes of Chorea.

"inflammatory reactions of rheumatic fever"

(all respect their latent period & sequence from the onset of strept infection)



INVESTIGATIONS of Rh. FEVER

INFLAMMATORY DISEASE

↑ TLC / ESR / CRP.

RECENT STREPT. INF.

"BUT DOESN'T INDICATE Rh. FEVER"

STREPT Abs

↑↑ ASOT

v. high titer or
Rising titer is
DIAGNOSTIC

Other ABs

- Anti-DNAse.
- Anti-Hyaluridase.
- Anti-Streptozyme if ASOT is -ve.

THROAT C & S
& Rapid Ag.
DETECTION.

CARDITIS

- 1) X-RAY ⇒ Cardiomegaly.
- 2) ECG ⇒ ↑ P-R interval & tachycardia.
- 3) Echo ⇒ pancarditis & valvular affection that doesn't appear clinically.

PREVENTION of Rh. fever & Infective Endocarditis

1^{RY} PREVENTION

GENERAL

↑↑ SHINE
(COMMUNITY)

Specific

Early Diagnosis &
ERADICATION of STREPT. inf. for 10 days.

2^{RY} PREVENTION

PREVENTION of RECURRENCE

(LAP)

if the HEART IS
INVOLVED

5 yrs. from the
LAST ATTACK

if the HEART IS
INVOLVED

upto 25 yrs.
OR for life

3^{RY} PREVENTION

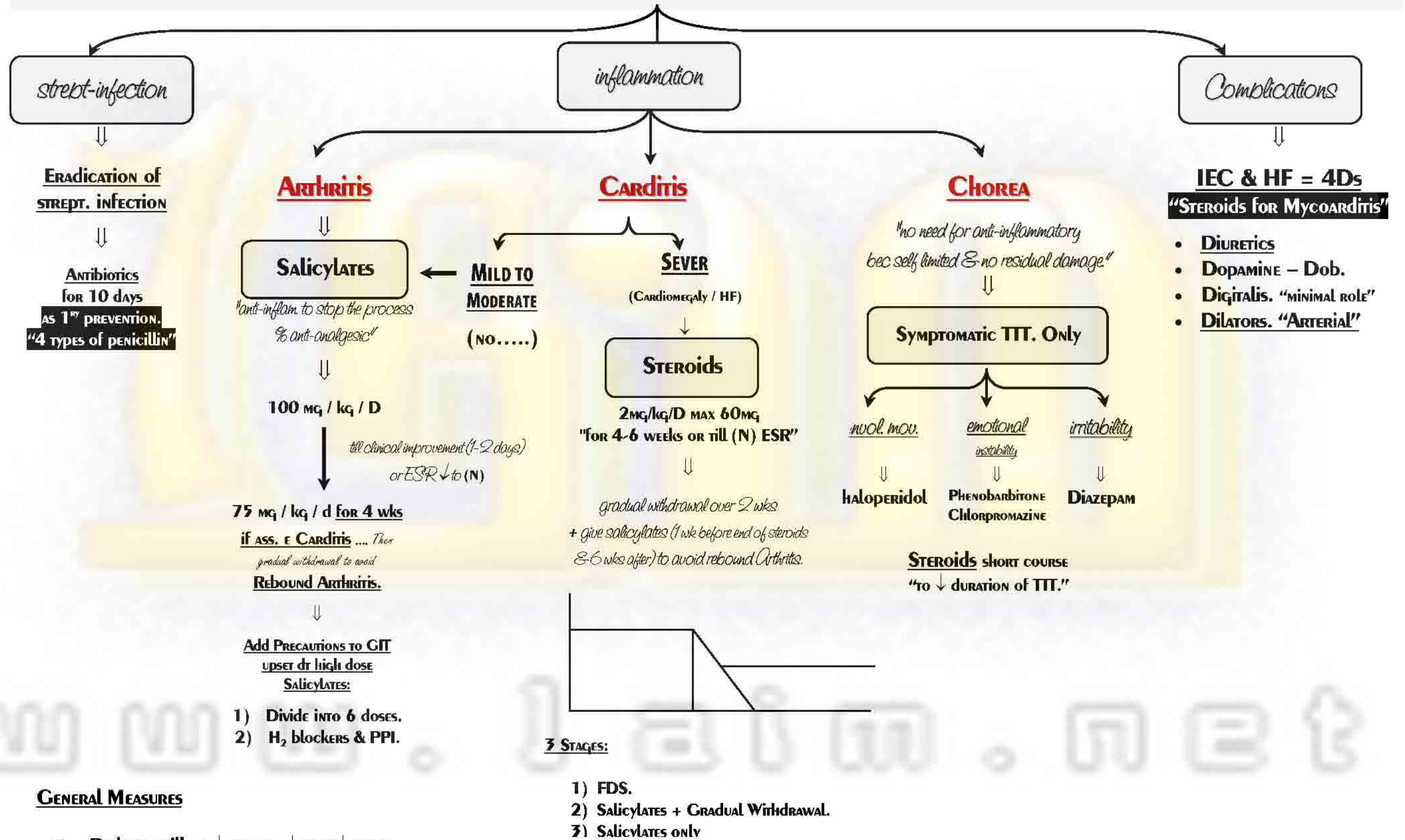
PREVENTION of IEC

Early Diagnosis & PROPER TTT. of
ANY focal INFECTION b4 BACTEREMIA

Anti-biotics	1 ^{RY} PREV.	2 ^{RY} PREV.
Penicillin G "Crystalline" Penicillin V "Oral"	100,000 U / kg / d.	250,000 U ONCE OR TWICE / day
PROCAINE penicillin	600,000 U / d.	
LAP "single IM inj."	< 6 ys. → 600,000 U. > 6 ys. → 1.2 million U.	1.2 million IU / 2 wks.
ERYTHROMYCIN if ALLERGY TO Oral penicillin.	40mg / kg / d.	250 mg TWICE/ day.

	URTI "STREPT viridians"		UTI / GIT	
	Amoxicillin	Erythromycin	Add IM Genta-mycin	Erythromycin OR VANCOMYCIN
BEFORE "by 1 hr"	50 mg/kg	20 mg/kg	2mg/kg initial dose.	
AFTER by 6hrs for 2d	25 mg/kg/...	10 mg/kg/...	BEFORE only	

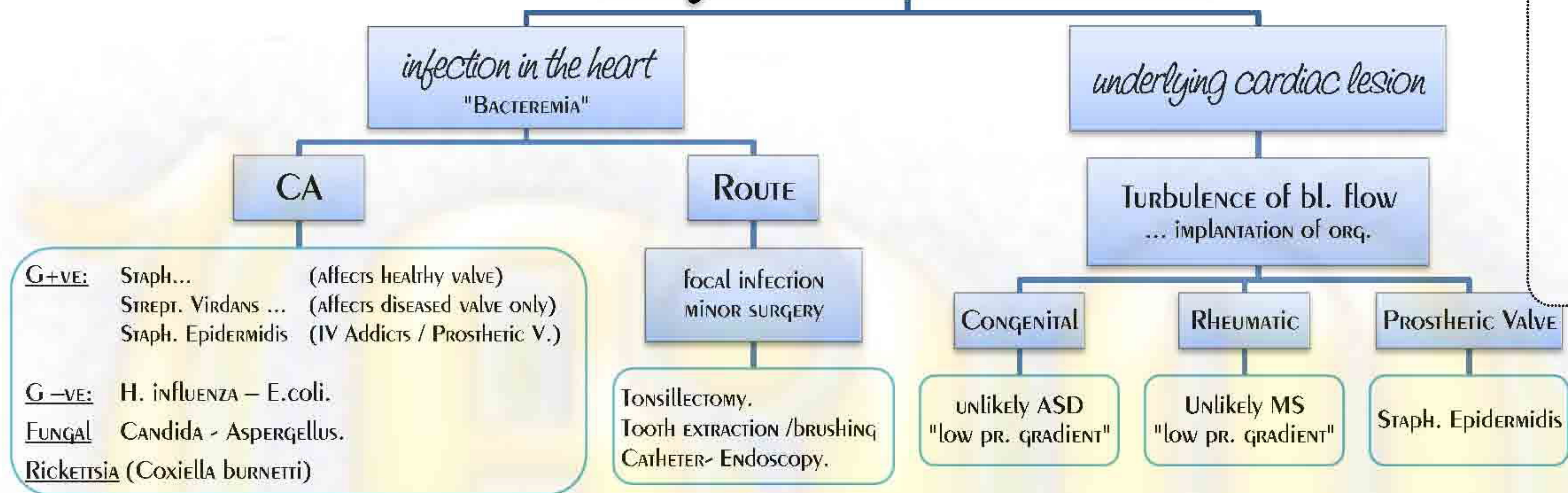
Ttt of rheumatic fever



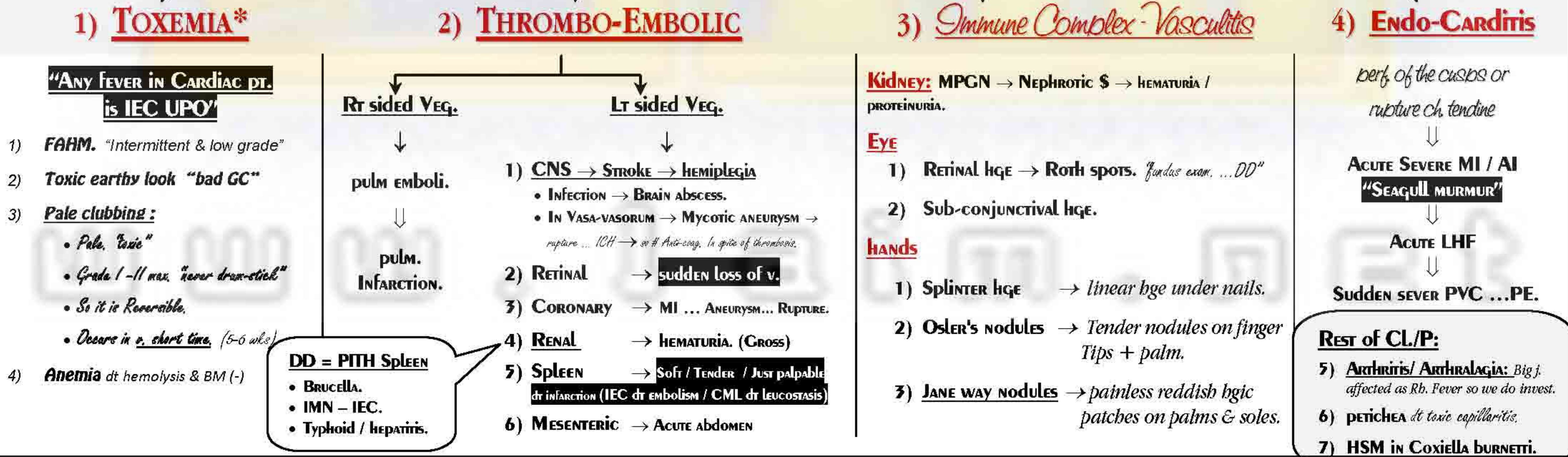
GENERAL MEASURES

- 1) Bed REST till → ↓ S & S - ↓ ESR ↓ CRP.
- 2) If CARDITIS → REST for 6 wks. AFTER ESR RETURN TO B.

Infective Endocarditis



CL./P of Infective Endocarditis



INVESTIGATIONS of *Infective Endocarditis*

INFLAMMATORY DISEASE

↓
 ↑ **TLC / ESR / CRP.**
NROMO/ NORMO ANEMIA

EVIDENCE of BACTEREMIA

Blood Culture

3 samples
 (aerobic / Anaerobic / special)

↓
If (-ve) C & S due to:

- 1) **ABS therapy.**
- 2) **FASTIDIOUS ORGANISMS:**
 (Chlamydia – Legionella –
 Coxiella Burnetti)

AUTO-IMMUNE Abs

- **CIC** (↓ C₃, C₄ dr CONSUMPTION)
- **+ve RF**

Focal GN

↓
URINE A.
proteinuria
hematuria

DISEASES

Endo-Carditis

- ↓
- 1) **ECG** ⇒ ↑ P-R interval & HR.
 - 2) **Echo (TRANS-oesoph.)** ⇒ *small vegetations.*
 - **IEC.**
 - **DISSECTING AORTIC ANEURYSM.**
 - **ASD.**

III. of infective endocarditis

“TTT. should be STARTED if IEC is Suspected”

MEDICAL

- ↓
- IV Empirical ABS till C&S**
- **IV penicillin G** 200,000 IU/kg/d
 - **IV GENTAMYCIN** 3-5 mg /kg/d.
 - **ANTI-STAPH. = VANCOMYCIN.**
- ↓
- AFTER C&S GIVE AB FOR AT 4-6 wks.**

NB: The prophylactic LAP for Rh. fever DOES NOT PREVENT IEC.

SURGERY

if PERSISTENT FEVER &
APPROPRIATE ABS

- **VR “prosthetic”.**
- **Abscess.**
- **Large veg.**

PREVENTION

“EARLY DIAGNOSIS & PROPER TTT. + PROPHYLAXIS”

PROCEDURE	ANTIBIOTIC REGIMEN
1) DENTAL OR URTI UNDER GA OR LA	Amoxicillin: 1000 mg / 12 hr. • 2 days before procedure. • The Day of procedure. • 2 days after the procedure
• If ALLERGIC	Clindamycin 600mg orally 1 hr before VANCOMYCIN infusion over at least 2 hrs.
2) SPECIAL-RISK PATIENTS: • PROSTHETIC VALVE. • PREVIOUS ENDOCARDITIS. • GENITOURINARY PROCEDURES.	• AMoxicillin (IV + Oral) • GENTAMYCIN 120 mg i.v. at induction + • If ALLERGIC: VANCOMYCIN infusion over at least 2 hrs.

	MS	MI	AS	AI						
<u>CAUSES</u>	<u>RHEUMATIC "almost always"</u> - PART OF MULTI-VALVULAR LESION. - ISOLATED MS (M/C). <u>OTHER ORGANIC CAUSES:</u> a) <u>Calcific MS</u> in elderly, Congenital MS. b) <u>LUTENBACHER'S \$</u> (Rh. MS + ASD) c) <u>CARCINOID TUMORS</u> METASTASIS TO LUNG, OR 1^{RY} BRONCHIAL CARCINOID.	1) Rh. F – IEC. 2) MV prolapse. 3) Ischemic papillary MS . 4) HOCM. 5) SLE.	<u>1) Valvular</u> <table><tr><td>A) Child</td><td>Rh AS almost always ASS. E MVD.</td></tr><tr><td>b) Old</td><td>Calcific AS ± CORONARY HD. YOUNG → Calcific Bicuspid AV.</td></tr><tr><td>c) طفل</td><td>CONG AS almost always isolated.</td></tr></table> <u>2) sub-valvular AS ⇒ HOCM.</u> - squatting → ↑VR → hrt dilate → ↓ aort. → ↓ murmur - Vasalva → ↓VR → ↓ hrt dilat. → ↑ Obst. → ↓ murmur <u>3) supra-valvular AS</u> - ELFIN FACIES. - MR. (William's \$)	A) Child	Rh AS almost always ASS. E MVD.	b) Old	Calcific AS ± CORONARY HD. YOUNG → Calcific Bicuspid AV.	c) طفل	CONG AS almost always isolated.	1) Rh. fever 2) \$ AORTIC ANEURYSM → AI 3) Post Valvotomy. 4) <u>SYSTEMIC diseases:</u> a) Ankylosing Spondylitis. b) RA → "AORTITIS" c) Marfan \$. (WEAK WALL OF AORTA) 5) ENDOCARDITIS. 6) <u>DISSECTION of AORTA.</u> (ACUTE AI)
A) Child	Rh AS almost always ASS. E MVD.									
b) Old	Calcific AS ± CORONARY HD. YOUNG → Calcific Bicuspid AV.									
c) طفل	CONG AS almost always isolated.									
<u>Organic</u>										
<u>Functional</u>	<u>1) CAREY COOMB MURMUR:</u> (Rh. activity → edematous cusps → Transient MS → reversible) <u>2) AUSTIN FLINT MURMUR: IN \$ AI</u> (REGURGED BL. → ↑ DIASTOLIC PR. IN LV → INTERFERES WITH FULL OPENING OF MV) <u>3) VSD DT OVER FLOW ACROSS MV.</u>	<u>LV dilatation dt</u> a) AI. b) HF. c) Dilated cardio-myopathy.	1) SEVERE AI 2) HPER-DYNAMIC CIRCULATION.							
HAEMO-DYNAMICS										
<u>TIGHT MS = MS INDEX < 25%</u> - Symptom: marked Dyspnea – Orthopnea. + P⁺⁺ - Sign: prolonged Murmur + OS nearby S₂ - INVEST.: Echo → VALVE AREA < 1 cm. - TTT.: pure → Valvotomy / Calcific → VR										

	MS	MI	AS	AI
➤ <u>CL./P</u>	Asymptomatic. 1) <u>↑ LA pr. → PVC</u> (Dyspnea....) - Gradual onset → pulm. VC → no PND or PE except if AF. - slowly prog. - long duration 2) <u>P⁺⁺ → RV⁺⁺ "LATE" → SVC.</u> 3) <u>↓ COP → EXERTIONAL & v. LATE bec.</u> a) <u>Early PVC</u> → Dyspnea → pt. can't exercise → no ↓ COP symp. b) <u>Late P⁺⁺</u> → ↓ PVC → ↓ Dyspnea → so pt. exercise → ↑ VR / HR → ↓ COP. 4) Palpitations. (irregular dt AF)	1) Palpitations. (Regular dt v. load) 2) <u>PVC due to MI & LVF</u> <u>ACUTE MI</u> ↓ <u>↑ LA pr. > dilatation</u> - Rupture cb. tendinae. - perf. cusps. dt IEC. - Rupture pap. ms. dt M. Infarction ↓ Sever PVC & PE <u>CHRONIC MI</u> ↓ <u>↑ LA dilat. > pr.</u> Dt gradual LA dilat. + V. OL on LV ↓ LVF (late) bec. bl. has 2 pathways 3) <u>↓ COP symptoms.</u> "If SEVER" 4) <u>RVF (LATE) → SVC.</u>	Asymptomatic for many yrs UN-like MS but DETERIORATE rapidly if symptoms develop. TRIAD "on exertion" <u>chest pain</u> On exertion dt ↓ • ↓ COP • LV⁺⁺ • Coronary As. (in old age) ↓ cop "syncope" ↓ exertion dt ↓ peripheral VD → reflex ↑ HR but ↓ COP AGAINST AS at rest in elderly dt ↓ Ca⁺⁺ of AVN ↓ Adam Stock's Attack LVF "late" ↓ PVC ↓ EXERTIONAL Dyspnea	<i>mild AI → palpitations only.</i> Sever AI <u>chest pain</u> at rest dt ↓ ↓ DBP < 50 → ↓ CORONARY filling during Diastole <u>palpitations</u> ↓ regular dt V. load Dyspnea ↓ dt ↑ LV Diastolic pr. ↓ Backward failure

➤ **GENERAL SIGNS**

	1) MALAR FLUSH: dusky pink disc. over cheeks due to A-V anast. + Vascular stasis! 2) <u>PVC</u> → <u>Bilat. Fine Basal Crepitations</u>. 3) <u>↓ COP signs.</u> 4) <u>RVF</u> → <u>SVC signs.</u> 5) <u>AF occurs (v. LATE)</u> - AGG. PVC. (PND OR PE) - AGG. ↓ COP. - EMBOLIZATION.	SAME AS MS BUT NO MALAR FLUSH.	Plateau pulse. (small volume with slow-rising) <i>how can you diff. bet....?!!</i> <u>Valvular</u> EJECTION SYSTOLIC CLICK <u>supra-v.</u> ELFIN FACIES "WILLIAM \$" <u>sub-v.</u> MURMUR HEARD ON PT. IN SQUATTING POS. chest pain → VALSALVA AS ↓ EXERTIONAL dt ↓ peripheral VD → reflex ↑ HR but ↓ COP AGAINST AS AI ↓ At REST ↓ dt ↓ DBP < 50 → ↓ CORONARY filling during Diastole	HEAD 1) CORRIGAN'S SIGN: ↑↑ Carotid pulsation. 2) CAROTID SHUDDERING: (s) thrill over carotid. 3) DE-MUSSET SIGN: Nodding of head. UL 4) WATER HAMMER PULSE: If Wide pulse pr. > 80 & DBP < 50) 5) CAPILLARY PULSATION. Quincke's Sign. / Muller's Sign in uvula - lips LL 6) PISTOL SHOT. "ON FEMORAL A." 7) DUROZIEZ'S SIGN: S & D murmurs over Femoral A. on slight pr. e stethoscope. 8) HILL'S SIGN: LL > UL by 40 mmHg.
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- MS → Dyspnea (early LA⁺⁺) → Palpitations (AF)... Irregular
- MI → Palpitations (Vol. OL) → Dyspnea (late LA⁺⁺ but v. large)Regular.

Inspection & palpation	MS		MI	AS	AI
	STAGE OF PVC	STAGE OF P++			
	• Chamber++ (Pulsations) • Thrill • Palpable HS	• LA++ → PUSHES RV ANT. NEAR CHEST WALL → LT. PARA-ST. PULS. • PA DILAT. → PULSATING P ₁ "systolic pulse followed by diastolic shock" • LT PARA-ST. HEAVE (RV++) • S₁ "SLAPPING APEX" (Palpable S ₁ + weak amplitude dt ↓ BV in LV) STAGE OF RVF → SVC	• LV++ (V. LOAD) → APEX SHIFTED DOWN & OUT. • (S) ON APEX, • S₁ "HYPER-DYNAMIC APEX"	• LV++ (CONCENTRIC HYPERTROPHY) → LOCALIZED APEX "SUSTAINED" → "SHIFTED IN LATE CASES" • (S) AT BASE NECK = ORGANIC AS • S₁ "HEAVY-SUSTAINED APEX" "THRUSTING"	• LV++ (S. DILATATION) → APEX SHIFTED DOWN & OUT. • S₁ "HYPER-DYNAMIC APEX"
	Auscultation				
1) HS MS ↓ S₁ 1) a.s. & ML 2) Calcific MS. MI ↑ S₁ 1) a.s. & MS. 2) ML in post. Leaflet (ant. leaflet closed)	STAGE OF PVC 1) ↑ S ₁ 2) OS dt OPENING M2, M3, ... VALVE 1) a.s. & ML 2) diastolic a.s. & ML 1) over MS → ↑ LA pr. → early closing of MV → RT heart failure	STAGE OF P++ 1) ↑ S ₁ (pulse component) 2) S ₁ ON TRICUSPID. (RV++ → ↑ DIASTOLIC RV PR. → FORCEFUL RA CONTRACTION)	1) ↓ S ₁ MUFFLED. 2) ↑ S ₁ IF PVC → P++ 3) S ₁ ON TRICUSPID dt RV++. 4) S ₂ GALLOP ON APEX (LVF) IN SEVERE MI.	1) ↑ S ₁ ↑ MS. COMPONENT (LV++) 2) ↓ S ₂ ↓ AORTIC COMP (↓ A. PR.) 3) S ₁ (dt ↑ DIASTOLIC PR. IN LV) 4) S ₂ GALLOP ON APEX (LVF)	1) S ₁ NORMAL. 2) ↓ S ₂ AORTIC COMP. BEC. AV DOESN'T CLOSE (AI) 3) S ₁ AT APEX (↑ DIASTOLIC LV PR. → FORCEFUL ATRIAL CONTRACTION)
2) MURMURS HOW TO DIFF. bet. ORGANIC & FUNCTIONAL MS: 1) ↑ S ₁ 2) OS. 3) +ve S & S.	• RUMBLING. • MID-DIASTOLIC + PRE-(S) ACCENTUATION. (MANTHA) • LOCALIZED AT APEX. 3) CAUSES of silent MS: (↓ BL. FLOW THROUGH M2) ↓ ASD + MS (LUTEN-BACHER MS) ↓ P++ (PULM. VC → ↓ bl. flow to lung & tr. side) ↓ RVF (↓ COP to lung → ↓ bl. flow to LA)	1) ESM dt PA DILAT. OF PA "PV SCLEROSIS" 2) LATE → DILAT OF PV → P ₁ → Chamber++	• SOFT - BLOWING. • PAN-SYSTOLIC IF POST. LEAFLET ↓ max. at a.s. & propagates to tr. side IF ANT. LEAFLET ↓ max. at tr. side & propagates to a.s.	• HARSH. • EJECTION-SYSTOLIC • MAKATA₁ (PROPAGATING FROM BASE TO APEX) • LOUD • HARSH • E THRILL. } ORGANIC AS • NB: MURMUR ISN'T A GOOD GUIDE FOR SEVERITY OF AS (BEC LVF → ↓ COP → ↓ INTENSITY OF MURMUR)	• HIGH PITCHED - DECRESCENDO نبح • EARLY DIASTOLIC (Coccard Shuddering is (S) thrill while Murmur is Early Diastolic) • MAX. AT A₂ PT. LEANING FORWARD. MURMUR AT APEX IN AI is: a) AI. b) FUNCTIONAL MI (LV DILAT.) c) AUSTIN FLINT MURMUR. (MS)

	MS		MI	AS	AI
Complications	1) <u>VALVE</u>	1) RF & IEC. "uncommon in MS dt (↓ pr. gradient across the MV + Marked MV thickening). 2) Calcifications.		<u>VALVE + MI</u> 170/40 ↓ Wide pulse (130) ↓ peripheral signs ↓ LV Compensated	<u>VALVE + LVF.</u> AS / MS / LVF "↓ COP" ↓ ↓ SBP ↓ LV DeCOMPENSATED 110/40 (↓ SBP) ↓ NARROW pulse (70) ↓ No peripheral signs ↓ LV DeCOMPENSATED
	2) <u>LT. ATRIUM</u>	1) AF → ↑↑PVC → STASIS → BALL & VALVE THROMBUS → POSITIONAL SYNCOPE. 2) MARKED LA++ → MEDIASTINAL S.			
	3) <u>P. VEINS</u> → PVC EAF → PE.				
	4) <u>P. ARTERIES</u> → P++ → EARLY.... REVERSIBLE DT PULM. VC / LATE.... IRREVERSIBLE DT SCLEROSIS OF PV.				
	5) <u>BED RIDDEN</u> → DVT → P. EMBOLISM.				
INVEST.	1) X-RAY. 2) ECG.		3) ECHO → (VALVE LESION / CALCIFIC / CHAMBER ⁺⁺ / PR. GRADIENT < 50 & EJECTION FRACTION) 4) CATHETER → PD / PO	(MI / AS / AI IS MANDATORY TO DO VR BEFORE LV DYSFUNCTION)	
➤ TREATMENT					
MEDICAL "MILD CASES & FOLLOW UP"	<u>MILD PVC → MILD DYSPNEA</u> 1) PROPHYLAXIS FOR RF & IEC. (LOW RISK) 2) <u>TTT. OF COMPLICATIONS:</u> A) PVC → DIURETICS. B) AF → DIGITALIS + ANTI-COAG. C) REMODELING → ACE-I		✓	<u>ttt. of Valvular AS</u> no role for medical ttt. in symptomatic pt. e pr. Gradient > 50 (BB TO ↓ TACHYCARDIA)	✓ 1. <i>Narrow pulse pr.</i> 2. <i>peripheral signs not evident</i> 3. <i>localized apex.</i>
SURGERY "SEVER CASES"	<u>Operate Early before P⁺⁺ or AF if the pt. is sympt. or PVC Not Responding to Drugs</u> Echo ↓ Calcific MS OR ASS. E MI ↓ VR PURE MS ↓ Valvotomy.....SEQUALAE: Early Re-STENOSIS ↓ RECURRENCE OF SYMPTOMS ↓ REPEAT VALVOTOMY. post-VALV. MI ↓ "POST-OP. PALPITATION" "REGULAR"		1) VR. 2) <u>VALVOTOMY B4 LVF</u> • SHIFTED APEX TO 6TH SPACE. • S3. • S. SYMPTOMS. • STENOTIC LESIONS → ↓COP → Reflex ↑PR → so avoid ACE-I (VD) as it will disturb the hemodynamics. • REGURGE LESION → dilatation → Remodeling → give ACE-I	1) VR "IF PR. GRADIENT > 50" ⇒ IF DELAYED → IRREV. LVF → SUDDEN DEATH. 2) <u>VALVOTOMY</u> ⇒ TRANSIENT IMPROV. → RE-STENOSIS. (in Non-Calcific or Cong. type)	1) VR. 2) VALVOTOMY.

- **STENOTIC LESIONS** → ↓COP → Reflex ↑PR
→ so avoid ACE-I (VD) as it will disturb the hemodynamics.
- **REGURGE LESION** → dilatation → Remodeling → give ACE-I

	TRICUSPID STENOSIS	TRICUSPID RESURGE
■ Etiology	1) RHEUMATIC usually associated with MV or AV D. 2) CARCINOID \$ Metastasis in liver → leakage of Serotonin to Rt. Side of the heart → fibrogenesis → TS/PS → not fibrosed in lung → No effect on MV / AV except if Carcinoid \$ in lung.	1) RV ++ (functional TI bec. MVD → PVC → P++ → RV++ → Dilatation of TV ring) 2) ACUTE TI → IEC (esp. IV Addicts...staph) 3) CONGENITAL TI → Ebstein's anomaly
■ C/P	1) ↓COP. 2) SVC → CONGESTED NECK VEINS → pre-systolic hepatic pulsation due ↑ RA contraction against TS during late Diastole → pre-systolic hepatic pulsations. 3) If associated with MS / TS → ↓PVC → ↓P++	RVF → SVC: 1) Neck veins congested – CYANOLCTERUS. - Cyanosis of venous stagnation - letras de Jandice 2) +ve hepatojugular reflux. (systemic cyanosis pale. Of the liver) 3) Ascites precox.
■ O/E	- Mid-diastolic Rumbling. - on Tricuspid area. - signs of SVC.	Pan-systolic MURMUR Rt. To STERNUM. (M1 "post. leaflet" heard near by Tricuspid area but not Rt. To Sternum). INCREASE WITH INSPIRATION
■ Echo	RA ++ dt TS.	a) of the cause.
■ III	1) Valvotomy (occasionally possible) 2) V.R. (often necessary)	b) SVC → DIURETICS. c) TV plication or VR if ORGANIC TI.

PULMONARY STENOSIS

CAUSES: Almost always congenital → valvular stenosis. Carcinoid \$ = sub valvular = infundibular. C/P ↓ COP (stenotic lesion) + RV++ → RVF → S.V.C. Chest pain (atypical) due to ↓ COP + Rt. V++ O/E RV+ + & Thrill (base + to the left)	
S₁ → ↓↓ P₂ + Wide splitting. S₂ → Gallop over tricuspid Area. (RVF) S₄ → on Tricuspid area.	valvular PS → ejection (S) click as AS + post (S) murmur infundibular PS → Ejection Systolic murmur over PA & Lower down. (like VSD)

INVESTIGATIONS	Echo or Catheter → if the Pul. C > 50 = SEVERE PS										
III.	<table><tr><th>Valvular PS</th><th>Subvalvular PS</th></tr><tr><td>eject. (S) click as AS</td><td>*</td></tr><tr><td>post. st. stenotic dilatation</td><td>*</td></tr><tr><td>Functional P.S</td><td>Innocent P.S</td></tr><tr><td>Valvotomy (balloon valvoplasty)</td><td>Resection</td></tr></table>	Valvular PS	Subvalvular PS	eject. (S) click as AS	*	post. st. stenotic dilatation	*	Functional P.S	Innocent P.S	Valvotomy (balloon valvoplasty)	Resection
Valvular PS	Subvalvular PS										
eject. (S) click as AS	*										
post. st. stenotic dilatation	*										
Functional P.S	Innocent P.S										
Valvotomy (balloon valvoplasty)	Resection										

	VSD	ASD	PDA	Fallots' Tetralogy
CL./P	1) Asymptomatic. (if small VSD) 2) LUNG plethora → EXERTIONAL DYSPNEA During suckling → Gr. R. → RECURRENT CHEST INFECTIONS. 3) LV ++ (V. load) → PALPITATIONS. (Tachycardia felt by the mother) → LVF A) SEVERE ↑PVC → ORTHOPNEA. (as PVC is already present at lung plethora) B) ↓COP → OLIGURIA & WEAK CRY. 4) REVERSE OF THE SHUNT → CENTRAL CYANOSIS → TRANSIENT ON EXERTION OR CRYING (↑VR to RV → RV pr. > LV → transient reverse shunt) → PERMANENT if EISENMENGER'S S & dt P⁺⁺	1) Asymptomatic. (dt ↓ bl. shunted) 2) LUNG plethora → RECURRENT CHEST INF. 3) RV ++ → MI 4) REVERSE OF THE SHUNT..... 5) PALPITATIONS AF. MI is present in: a) CORONARY HD. b) HOCM. c) Low ASD. (primum)	1) Asymptomatic. 2) PVC. 3) PALPITATIONS. 4) ↓ COP. (in LL) 5) Differential Cyanosis if EISENMENGER'S S. DD of Differential Cyanosis: (Normal upper 1/2 + hypoxic lower 1/2) a) Acyanotic F4 = mild PS b) 3 shunts b4 reversal of Shunt. c) IPD	HYPOXIA causes: 1) CYANOSIS CENTRAL SHORTLY AFTER BIRTH!!! (TILL DUCTUS CLOSES) 2) CLUBBING → DRUM STICK. 3) STUNTED GROWTH. 4) Hyper-Cyanotic SPELLS → SQUATTING. COMPONENTS: 1) PS → MOST. IMP. DETERMINES SEVERITY. 2) VSD → non-functioning bec. RV & LV are subjected to equal pr. during systole dt (3) 3) Over-riding of AORTA → CENTRAL CYANOSIS 4) RV++ → mild bec. bl. has 2 pathways. (PA / Aorta)
	Inspection & palpation			
• CHAMBER ++ بالتدقيق	1) LV++ (V. load) → APEX SHIFTED DOWN & OUT 2) P⁺⁺ → PA dilatation → PULSATING PULM. AREA. 3) RV++ dt P⁺⁺ → Lt. PARA-ST. puls. (No VL bec. bl. reaches RV during systole & goes directly to PA → No VL)	1) RV++ (V. load) → Lt. PARA-ST. puls. 2) P⁺⁺ → PA dilat. → PULSATING PULM. AREA.	• LV++ (CONCENTRIC HYPERTROPHY) → LOCALIZED APEX "SUSTAINED" → "SHIFTED IN LATE CASES"	• mild RV ++ → ± Lt. PARA-ST. puls.
• Thrill	• ±(S) OVER LT PARA-ST. (RV++)	•	• CONT. OVER LT. INFRA-CLAV. AREA.	• (S) OVER PA DT MURMUR OF PS.
• Palpable Sounds	• S₁ "PROMINANT APEX" • S₂ "DIASTOLIC SHOCK"	• S ₂ "DIASTOLIC SHOCK"	• S ₁ "HYPER-DYNAMIC APEX"	• S ₁ "HYPER-DYNAMIC APEX"
	Auscultation			
1) HS	1) ↑ S₂ IF P⁺⁺ & WIDE SPLITTING. 2) S₃ on apex dt LVF.	↑ S₂ dt functional PS ⇒ P⁺⁺ Wide Fixed splitting v. load ↑ VR & deep insp. → ↑ RA pr. RBBB (ass.) → Closes the shunt but fixes RV filling. delay P₂	1) ↑ S ₂ IF P ⁺⁺ REVERSED SPLITTING.	↑ S₂ (single loud) ↑ A2 ↓ P2 dt ↑ Aortic bl. flow + AV opens in Dt PS ... ↓ pulse bl. RV → near to chest wall → Loud flow → Single.
2) MURMURS	• Harsh - PAN-systolic. ± ESM over Pulm. Area dt P⁺⁺ • MAX. LT. PARA-STERNAL. • PROPAGATED ALL OVER PRECORDIUM.	• Soft - Ejection systolic. • MAX. AT PA. • ± PROPAGATED TO LT. PARA-ST. (func. PS)	• CONTINUOUS MACHINERY. • MAX LT. INFRA-CLAVICULAR. • PROPAGATED TO LT. PARA-ST.	• Harsh - Ejection systolic. (Of PS not VSD) • MAX. AT PULM. AREA if Valvular. OR LT. PARA-STERNAL AREA if sub-valvular. • PROPAGATED TO INFRA-CLAV. AREA.

CO-ARCTATION OF THE AORTA

(NARROWING OF THE AORTA)

Types

- 1) **Infantile Type:** narrowing is Proximal to lt. subclavian → ↑↑↑ BP in head & neck → cerebral hge. → (Incompatible with life)
- 2) **Adult Type:** narrowing just distal to the origin of the lt. sub-clavian. (Isthmus)
 - FEMALES > MALES; MAY BE ASSOCIATED E
 - TURNER'S S.
 - Bicuspid STENOTIC AV.
 - ANEURYSM IN Circle of Willis (BERRY'S ANEURYSM)

C/P → HYPERTENSIVE Child ASYMPTOMATIC.

- 1) BP → UL > LL with radio-femoral delay.
- 2) LL ISCHEMIA → Caudication pain.
- 3) SUZMAN sign → pulsating intercostal arteries in the back.
- 4) **MURMURS IN CASES OF COARCTATION:**
 - a) on the back due to co-actation.
 - b) On Aortic area Due to associated bicuspid AV (Dilated Aorta → AI)
 - c) Machinery murmur over the collaterals. (dt ↑↑ pr. gradient)

HYPERTENSION is dt:

- 1) Co-arcitation.
- 2) Descending Aortic Ischemia
→ Renal ischemia → ⊕ RAS
→ HTN.

INVESTIGATIONS: (MRI is diagnostic)

- 1) X-RAY → POST-STENOTIC dilatation.
- 2) AORTOGRAPHY.
- 3) CATHETER.
- 4) ROSLER'S SIGN: Notches in the lower parts of ribs due to ↑↑ pr. of IC collaterals.

TREATMENT

- 1) Surgery in early childhood (before Glomerulo-sclerosis → persistent HTN even after Surgery)
- 2) Resection & anastomosis.
- 3) graft may be needed.

➤ NB:

- ACQUIRED COARCTATION MAY OCCUR DUE TO TRAUMA OR TAKAYASU'S DISEASE.
- HYPERTENSIVE child → GN / COARCTATION

EISEMNGER'S S

- 20 % of cases of shunt esp. VSD
- Genetically determined dt persistence of the fetal pattern of the pulm arterioles (abnormal ms. P.)
- **C/P**
 - **Cyanosis – Clubbing.**
 - P++
 - ↓ C.O.P.
 - signs of P++ → pulsations / dullness / S₂ ↑ (P++)
- **INVESTIGATIONS**
 - 1) X-ray P++
 - 2) ECG P- pulmonale
- **III.:** Surgery is of no value bec. shunt acts as a safety valve → Heart & lung transplant?

DISEASES OF AORTA

- 1) **ANEURYSM of ASCENDING AORTA** → AI dt Syphilis → aneurysm of signs.
- 2) **ANEURYSM of the ARCH** → mediastinal S → Aneurysm of Symptoms.
- 3) **DISSECTING AORTIC ANEURYSM**

Tear in intima of Aorta → B.l. bursts into media of Aorta → Dissection (Thick Wall / Narrow lumen)

→ Obstruction of Aortic br → ischaemia → UN-EQUAL pulse volume.

→ Damage of the Aortic Valve → AI

- **CL/P:** Old male + UN-CONTROLLED HTN ⇒ ACUTE CHEST PAIN + Shock
(Radiating to back)

- **O/E:**

- 1) **UN-EQUAL pulse volume.** (dt obst. Of Aortic br. Openings)
- 2) **AI ⇒ Early diastolic MURMUR.** (dt widening of the Aortic root)

- **Etiology** ⇒ HTN + Atherosclerosis + Collagen D.

- **INVEST.** ⇒ CT SCAN / MRI. "DIAGNOSTIC" + Echo "TRANS-OESOPH"

- **III.** ⇒ Control BP + SURGERY & Graft.

DD.. ACUTE Chest pain + Shock:

- 1) TENSION PNEUMO-THX.
- 2) EXTENSIVE MI.
- 3) MASSIVE pulm. Embolism.
- 4) DISSECTING Aortic An.

MYOCARDITIS

Etiology:

- 1) **Viral:** Cocksakie. Influenza. (Myocarditis occur several wks after viral infection)
- 2) SLE, RA.
- 3) Rheumatic fever. .
- 4) Sarcoidosis.

CL/P OF HF.

- 1) Inappropriate Tachycardia + Muffling of H.S.
- 2) Manifestations of the cause.

INVEST.:

- 1) ECG & Echo.
- 2) of the cause e.g viral serology.
- 3) **↑Troponine and cardiac enzymes.**

HF + STEROIDS?!

- 1) SLE.
- 2) Rh. FEVER.

TREATMENT: of HF + STEROIDS?!! (Viral)

LA Myxoma

➤ Def.	Benign Tumor from the IAS encroaching the LA. (M/C 1 st tumor of heart)
➤ CL/P	• young female + positional syncope: (as the pedunculated tumor obstructs the valve orifice) • Tumor Emboli → hemi-plegia. • Intermittent MS (rumbling) → disappears on lying on lt. side.
➤ INVEST.	Echo - ↑ESR
➤ TTT	Resection.

MITRAL VALVE PROLAPSE = (Click MURMUR \$)

➤ **DEGENERATIVE MVD in cusps (MYXOMATOUS)**

- Prolapse of MV cusps into LA (mostly post. leaflet)
- abnormal V. contractions, papillary ms. strain ± MI

➤ **CAUSES:** UNKNOWN ± **MARFAN'S \$** AND **Thyro-toxicosis**

➤ **CL/P:** **YOUNG FEMALE + palpitation + Atypical Chest pain.** "dt papillary ms. strain from MV prolapsed"

DIAGNOSIS: **Early Ejection systolic click** + **Late systolic murmur** + **Echo.** (dt ballooning of cusps into LA) (not pan-systolic)

➤ **TREATMENT:**

- ββ (prophylaxis against arrhythmia & chest pain).
- Prophylaxis against IEC in significant M.I.
- VR for severe MI.

YOUNG FEMALE + palpitations **+ Atypical Chest pain**

- MV prolapse.
- Thyrotoxicosis – ANEMIA.
- CARDIAC NEUROSIS.

NB = ALL MURMURS:

- ↓ ON STANDING EXCEPT HOCM & MV Prolapse.
- ↑ by EXERCISE EXCEPT HOCM

p. 102 CAUSES of hyper-dynamic Circulation

- | | |
|---------------------------------|------------------------|
| 1) ANEMIA | 5) BERI-BERI. |
| 2) THYROTOXICOSIS. | 6) PREGNANCY. |
| 3) 3 SHUNTS = (ASD / VSD / PDA) | 7) DRUGS = Nifedipine. |
| 4) LCF → VD. | 8) FEVER. |

p. 104 hyper-TENSIVE Child

- 1) GN.
- 2) COARCTATION.

p. 105 CYANOSIS SINCE BIRTH.

- 1) TGA.
- 2) EbSTEIN ANOMALY → CONG. TI → CYANO-ICTRUS.
- 3) TOTAL ANOMALOUS.
- 4) F4 ⇒ AFTER 6 wks.

p. 106 EbSTEIN ANOMALY

- 1) RA ++. **(HUGE RA)**
- 2) CONG. TI → CYANO-ICTRUS.
- 3) ± ASD
- 4) **CENTRAL CYANOSIS** dt SHUNTING of bl. THROUGH ASD. (REVERSED SHUNT)

p. 125 1ry Hyper-lipidemia = FAMILIAL hyper-CHOLESTEROLIA

- AD.
- XANTHOMAS - XANTHELMAS.
- IRIS... "ARCUS SENILIS"

4 SIGNS of LVF:

- 1) PULSUS ALTERNANS.
- 2) S3.
- 3) Bilat. FINE BASAL CREPITATIONS.
- 4) SHIFTED APEX.

Fundus Examination

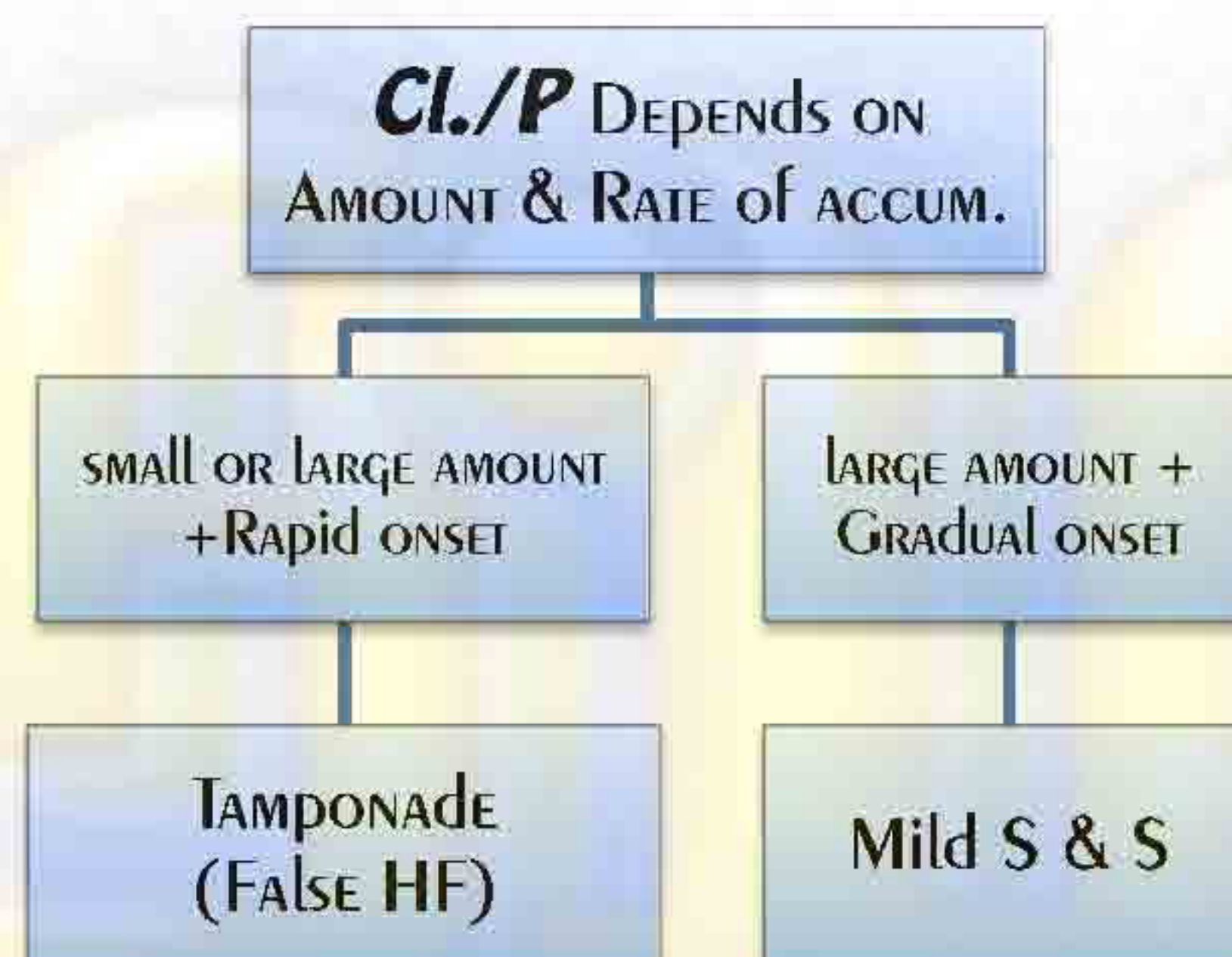
- | | |
|----------------------------|---|
| 1) BENIGN HTN | → SILVERY WIRE. |
| 2) MALIGNANT HTN | → MACULAR STAR + PAPILLOEDEMA. |
| 3) DM | → RETINOPATHY + VIT. HGE. |
| 4) Miliary TB | → CHOROIDAL TUBERCLES |
| 5) IEC | → Roth's Spot. |
| 6) POLYCYTHEMIA RUBRA VERA | → ENGORGED RETINAL V. |
| 7) <u>PAPILLOEDEMA</u> | BRAIN TUMOR / PSEUDO-TUMOR.
CST / CO ₂ RETENTION. |
| 8) <u>PAPILLITIS</u> | <u>ON. (ISOLATED OR / PART OF MS)</u> |

Important Notes in Cardiology

PERICARDIAL EFFUSION

CAUSES:

- 1) **Bloody** → **TRAUMA** → **Rupture ANEURYSM of AORTA.**
- 2) **Hqic** → **Malignancy – TB – CRF.**
- 3) **EXUDATE** → **TB – Malign – Viral.**
- 4) **TRANSUDATE** → **PART of G. edema (Nephrotic S)**
- 5) **Chylous** → **fluid is milky white rich in FAT.**



DD OF PERICARDIAL EFFUSION

DD OF PERICARDIAL EFFUSION

	HEART FAILURE	PERICARDIAL Effusion
CL/P	• ↓ COP. • LVF → PVC. • RVF → SVC • NO Ascitis.	RETRO-STERNAL OPRESSION + COMPRESSION ON • LV → ↓ COP. • LA → PVC → <i>Dyspnea – Orthopnea</i> • RA → SVC → <i>Neck veins.</i> • PRAYER position → <i>shift of fluids away from pulm. V. & LA → ↓ PVC.</i>
➤ NECK VEINS	✓ CONGESTED. (↓ E Inspiration dt (-) VE INTRA-THORACIC PR.)	✓ INSPIRATORY filling. (KAUSSMULL'S SIGN)
➤ PULSE	✓ PULSUS ALTERNANS	✓ PULSES PARADOXES.
➤ HS	✓ S ₃ Gallop.	✓ DISTANT HS.
➤ MURMUR	✓ MI / TI dt DILATED HF	✓ NO MURMUR.
		PERCUSSION • dullness OUTSIDE THE APEX • ↑↑ BARE AREA. • EWART'S SIGN = <i>Lt. intra-capsular dullness dt comp. of the Lt. lung → left basal collapse</i>
TMT.		
	4 Ds 1) DOPAMINE. DOBUTAMINE. 2) DIGITALIS. 3) DIURETICS. 4) DILATORS.	1) PERICARDIO-CENTESIS. "EMERGENCY" 2) PERICARDIAL WINDOW. 3) PERICARDIECTOMY. 4) STEROIDS TO ⊖ ADHESIONS.

INVESTIGATIONS

- 1) X-RAY → *flask shaped heart.*
- 2) Echo → *"best" + Determine severity.*
- 3) ECG → *↓↓ voltage of QRS < 5 mm.*
- 4) PERICARDIOCENTESIS → *Diagnostic & Therapeutic.*

PERICARDIAL Effusion:

- 1) DYSPNEA – ORTHOPNEA.
- 2) NECK VEINS.
- 3) PULSUS PARADOXUS.

"SVC Obst. is more common in Constrictive pericarditis"

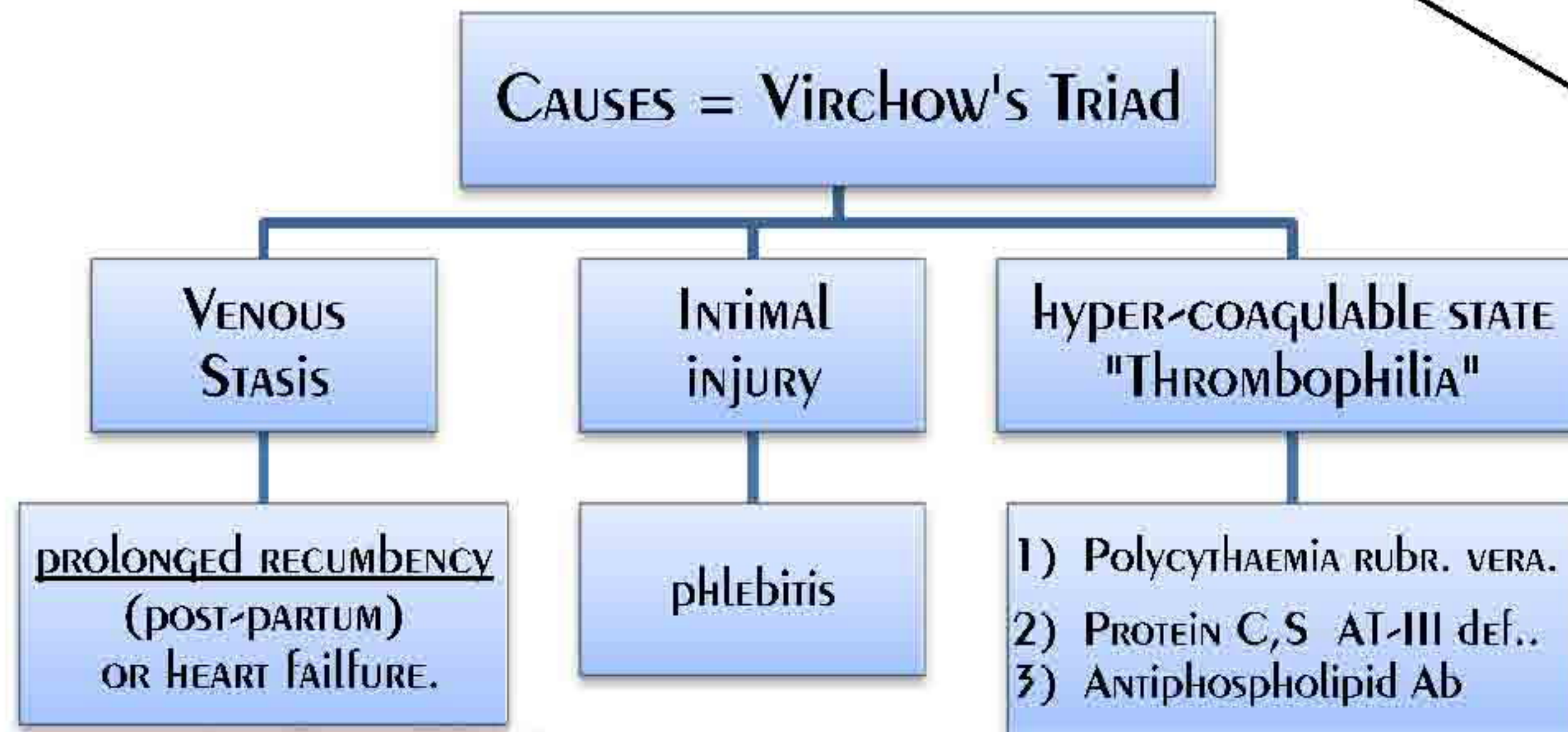
PERICARDITIS

	ACUTE PERICARDITIS	CONSTRICTIVE PERICARDITIS	ADHESIVE PERICARDITIS
CAUSES	1) Viral: (M/C & Relapsing pericarditis) • Parvovirus - Echo • Influenza • Measles - Mumps 2) TB. MALIGNANT. (BREAST / LUNG) 3) PURULENT: 4) Collagen D. UREMIA. 5) Rh.F. & M. INFRACTION	ADHERENCE of 2 layers of pericardium INTERFERING with the MECHANICS of TTT. 1) TB - VIRAL. 2) Rh.D - PURULENT. 3) HAEMOPERICARDIUM.	ADHESIONS bet. THE 2 layers & THE SURROUNDING STRUCTURES in MEDIASTINUM. ▪ RHEUMATIC FEVER
➤ CL/P			
	1) <u>OF THE CAUSE.</u> 2) <u>Flu-like symptoms</u> → Sudden Chest Pain (dr Viral Infection) • <i>Scratching</i> • <i>Retro-sternal radiating to shoulders & neck.</i> • <i>↑ by inspiration - mov. - swallowing.</i> 3) Pericardial rub.	<u>CL/P as effusion but....</u> 1) Dyspnea - Orthopnea 2) Neck veins. (<i>inspiratory filling - Kussmaul's Sign</i>) 3) Pulsus paradoxus. (Inspiratory ↓ in BP > 20 mmHg / As Acute Severe Asthma) 4) AF. (↓ v. filling → ↑ LA pr. → LA dilatation → AF) 5) Pericardial knock = 3rd HS. (early diastolic filling) 6) Ascites precoc. (linking of liver → as liver congested → ascites b4 LL edema)	1) Associated valve lesions. 2) Fixed Apex + Systolic intercostal retraction → Broad bent's sign = No rotary mov. Of the ventricles 3) As Constrictive pericarditis.
INVEST	• ECG → ↑↑ST segment (Transient MI - Vaso-spastic Angina / Acute pericarditis) • ↑ CK if ASS. E Myocarditis. • INVERTED T.	• X-ray → <i>small sized heart + Ca of pericardium.</i> • ECG → <i>↓ Voltage as pericardial eff.</i> • CT scan OR MRI → <i>pericardial Ca⁺⁺</i>	• Fluoroscopy = Dynamic X-ray (linking of oesoph. with cardiac beat)
TTT.	1) <u>OF THE CAUSE.</u> 2) NSAIDs. (Indomethacin 25mg / 8hrs) 3) STEROIDS ?! (Viral) # Anti-Coagulants → HEMOPERICARDIUM.	Anti TB & pericardiectomy. (DD = Restrictive Cardiomyopathy)	of the cause + surgery

CARDIOMYOPATHY = DIAGNOSIS OF EXCLUSION

	Dilated CM (Bi-Ventricular Failure)	HOCM	Restrictive CM (Diastolic failure)
CAUSES	1) Alcohol – Myopathy. 2) ↓ Selenium. 3) Haemochromatosis. 4) Cyclo-phosphamid. 5) F ATAXIA 6) SLE – polymyositis. 7) Idiopathic.	AD ↑↑ Thickness of IVS. ↓ ENCROACH THE AORTIC OPENING ↓ AS due to LV outflow obst. = Diastolic dysfunction ± ML	1) Amyloidosis 2) Haemochromatosis. 3) Sarcoidosis } OSIS
CL/P	<u>Bi-Ventricular failure:</u> • Systolic dysf. • ± AF dt LA dilatation.	Sudden death in Young Age with +ve FH (During, or just after vigorous exertion) <u>Criteria:</u> • AS (sub-valvular) • Diastolic Dysf. • ML	<u>Of Constrictive pericarditis.</u> • Diastolic dysf. → ↑EDP → Atrial contr. • 4th HS. (3rd HS is Constrict. peric.) • AF dt ↑ LA pr.
INVEST	Echo – X-ray – ECG <u>Reversible Dilated CM:</u> (Alcohol / Post-partum – Selenium / Hypo-thyroidism)	1) Echo. 2) <u>Murmurs of HOCM:</u> AS → ESM with the base • ↑ by Valsalva dt ↓ VR → ↓ heart dilat → ↑ obst → ↑ murmur • ↓ by Squatting dt ↑ VR → ↑ heart dilat → ↓ Obst → ↓ murmur. 3) ECG → deep Q wave.	NB (MCQ) = All Murmurs! • ↓ + Valsalva & Standing except HOCM & MV Prolapse • ↑ by exercise except HOCM
TREATMENT	<u>AS HF = 4 Ds:</u> 1) Diuretics. 2) Dilators. 3) Digitalis if AF.	<u>Avoid Vigorous Exertion:</u> 1) ββ + Verapamil → ↓↓ outflow obst. 2) Arrhythmia → Amiodarone. # VD → ↑ outflow obst. # Digitalis is → ↑↑ outflow obst. ➤ Myomectomy → ↓↓ thickness of septum.	<u>رحرر القلب Ventricle</u> 1) ββ + Verapamil. 2) Heart transplant if Amyloidosis.

DVT



DD of DVT (TENDER CALF MS)

- 1) DVT
- 2) Cellulitis
- 3) RUPTURE PLANTARIS.
- 4) PERIPH NEURITIS.
- 5) OSTEOMYELITIS.

DVT in LL (Ilio-femoral VEIN)

- 1) LL EDEMA. (UNILATERAL)
- 2) TENDER CALF MS.
- 3) TENDERNESS ALONG THE COURSE OF FEMORAL V.
- 4) **+VE HOMAN'S SIGN** → PAIN IN CALF MS. ON DORSI-FLEXION OF FOOT.

Thrombophilia

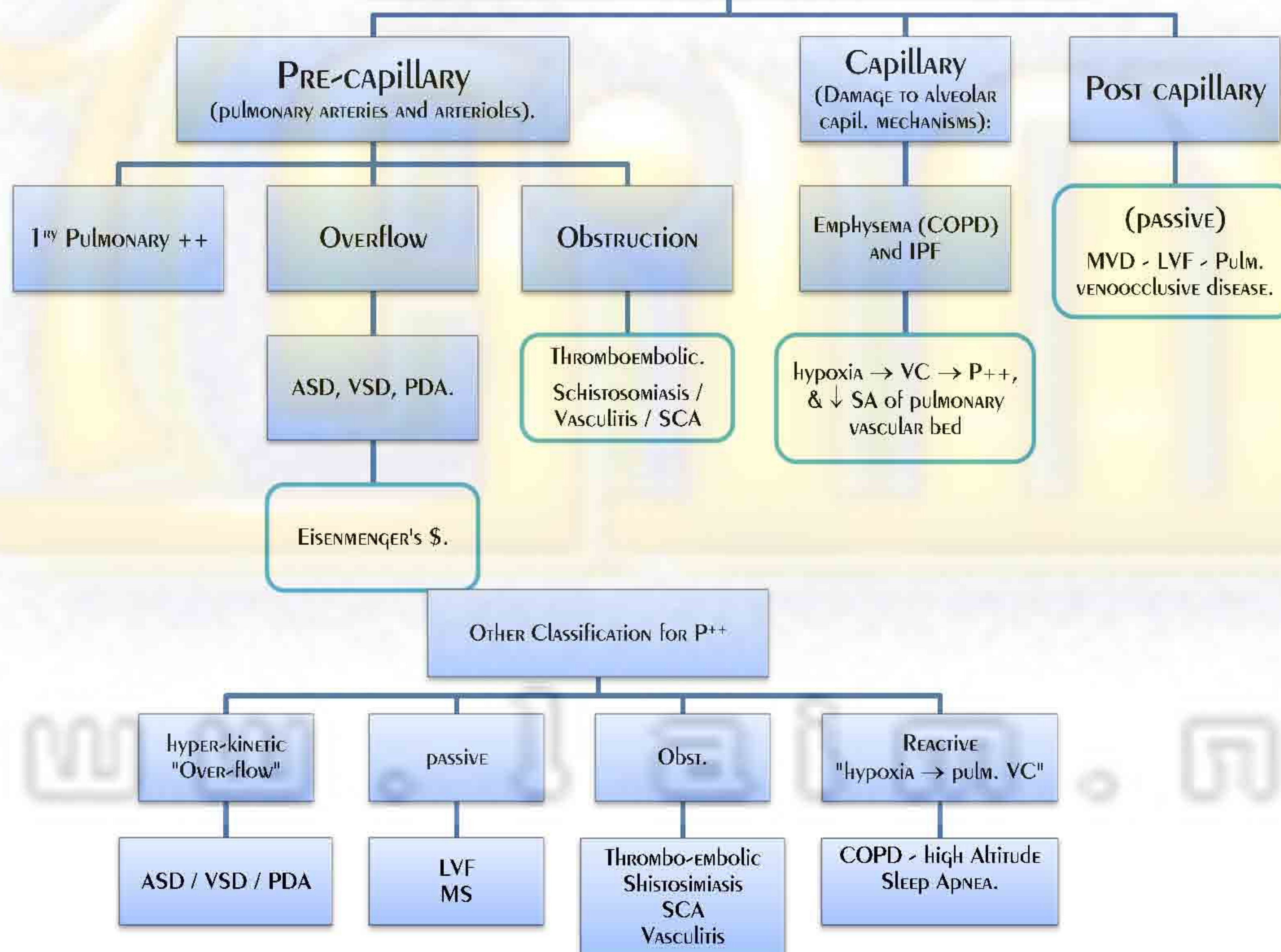
- YOUNG AGE.
- RECURRENT DVT + ARTERIAL THROMBOSIS.
- THROMBOSIS IN SPECIFIC SITES. (BUDD CHIARI S)

INVESTIGATIONS Duplex SCAN + FOR THROMBOPHILIA.

OTHER SITES OF DVT

SITE of DVT	CAUSE	CL/P
1) PORTAL VEIN THR.		PH → EV / SPLENOMEGALY / ASCITES
2) RENAL VEIN THROMBOSIS	1) MEMBR. GN. (M/C) 2) Dehydration. 3) Blood Disease	1) LOIN PAIN & TENDERNESS. 2) RAPID DETERIORATION OF KID FUNCTION. 3) PROTEINURIA. (dt ↑ RENAL PR.) <i>"Nephrotic S" → RV thrombosis</i> <i>→ Acute severe deterioration + loin pain</i>
3) IVC THROMBOSIS	1) Typhoid. 2) Behcet's.	1) LL EDEMA. (BILATERAL) 2) ASCITES. 3) COLLATERALS ON ABDOMINAL WALL.
4) SVC THROMBOSIS	CAUSES of SVC Obst.: 1) Constrictive P. 2) Mediastinal mass 3) SVC Thrombosis.	1) FACIAL EDEMA + PERIPH. CYANOSIS IN TONGUE dt venous stag. 2) CONGESTED NON-PULSATING NECK. V. 3) CHEST COLLATERALS. Directed from above downward.
5) AXILLARY V. THROMBOSIS		• EDEMA OF THE ARM. • TENDERNESS. ALONG THE COURSE OF AXILLARY V.

PULMONARY HYPERTENSION



PULMONARY EMBOLISM

SOURCES of Pulm Embolism

- 1) DVT in LL.
- 2) IEC of Rt. side.
- 3) FAT - AMNIOTIC fluid - Air

CL/P

(ACCOERDING TO THE SIZE of Emboli)

SMALL EMBOLI

NO SYMPTOMS but if...
RECURRENT SHOWERS of Emboli
obliterating >2/3 of vas. bed

Thrombo- Embolic P++
(Cough / Dyspnea / Discomfort)

RVF

(sub-ACUTE
COR pulmonal)

MODERATE EMBOLI

PULM INFARCTION
if HEMODYNAMICS of the lung
ARE DISTURBED (COPD/ PVC)

- 1) Dry Cough & hemoptysis.
 - 2) Dyspnea.
 - 3) Chestpain, "pleuritic"
 - 4) fever. "low grade dt T. damage → ↑TLC"
- ± CREPITATIONS

Till INVEST.
"It may be"

Pulm. Embolism E
INFARCTION

Anti-Coagulants
if No #

PNEUMONIA

ABS

MASS EMBOLISM

Pulm. Embolism
"Obst. of pulm. ARTERY"

ACUTE Chest Pain + Shock (DD)

(Shock dt ↓ bl. flow to lung → ↓ VR to LA → ↓COP)
(Chest pain dt Rapid distention of PA against RV)

- 2) Cyanosis = hypoxia.
- 3) ACUTE RVF.

INVEST.

X-Ray

- 1) Normal.
- 2) Infarction = wedge shaped opacity.
- 3) pl. effusion. ± PE.
- 5) Dilated PA.

Blood

↑ ESR / ↑ TLC
(hypoxia in
MASSIVE
Embolism)

LUNG SCAN

"Easy / Rapid / Cheap"

VENTILATION SCAN

Pt. INSPIRES
(XENON)

DETECTIVE
distribution in
lung.

PERFUSION SCAN

IV INJECTION of
RA (Tc)

DETECTIVE
Uptake by pulm.
ARTERIES

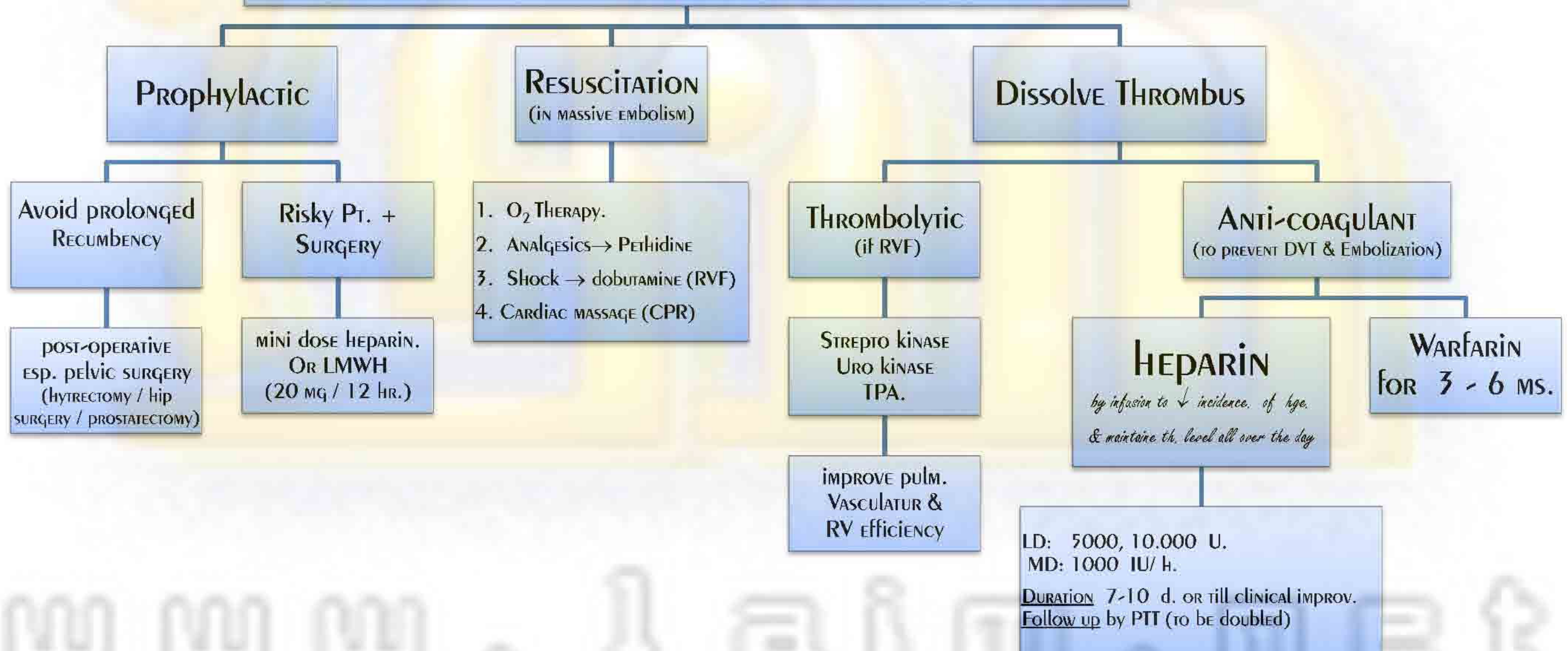
Pulm ANGIO
"DIAGNOSTIC
but INVASIVE"

Spiral CT
Angio +
IV CONTRAST

NB:

- pulm. Embolism → NORMAL VENTILATION + Abnormal perfusion.
- pulm fibrosis → Abnormal VENTILATION & perfusion scan.

TTT of *PULM. EMBOLISM* & DVT



HYPER-LIPIDEMIA

1 ^{RY} HYPER-LIPIDEMIA					2 ^{RY} HYPER-LIPIDEMIA
	TYPE	INCREASED	↑BLOOD LEVELS	DEFECT	
I	HYPER-CHYLOMICRONEMIA	Chylomicrons	TG, Cholesterol	Lipoprotein	1) Endocrinal: • DM → ↑TG • Hypo-Thyroidism → ↑Cholesterol. 2) Renal: • Nephrotic S → ↑ LDL & Cholesterol. • CRF → ↑TG. 3) STORAGE D → Glycogen SD. – GAUCHER'S D. 4) Drugs. • ββ (NS) → ↑TG • Thiazides → ↑TG. • Alcohol → ↑TG • Steroids – OCP – Obesity.
IIa	HYPER-CHOLESTEROLEMIA	LDL	Cholesterol	↓ LDL Receptors	
IIb	COMBINED HYPER-LIPIDEMIA	LDL, VLDL	TG, Cholesterol	↑ hepatic production of VLDL	
III	DYS β-LIPO-PROTEINEMIA	IDL, VLDL	TG, Cholesterol	Altered Apo-lipoprotein E	
IV	HYPER-TG EMIA	VLDL	TG	↑ hepatic production	
V	MIXED HYPER-TG EMIA	VLDL, Chylomicrons	TG, Cholesterol	↑ production / ↓ Clearance of VLDL & Chylomicrons.	

DRUGS THERAPY OF HYPER-LIPIDEMIA

- ↑LDL → A.s. + ISHD.
- ↑TG → pancreatitis.
- STATINS & FIBRATES ARE UNSAFE TO BE USED TOGETHER → Rhabdomyolysis → ARF.

1) FIBRATES	FENOFIBRATE. (LIPANTHYL) 300 MG/D	↓TG - ↑HDL.
2) STATINS	SIMVASTATIN. (ZOCOR)..... ATROVA-STATIN. (LIPITOR) 10-80 MG/D.	↓LDL.
3) RESINS		↓LDL.
4) NICOTINIC ACID		↓TG - ↑HDL.
5) OMEGA 3		↓TG - ↑HDL.